



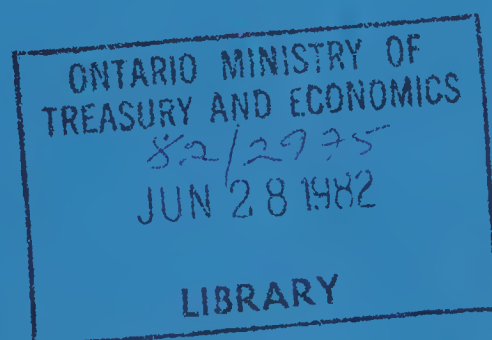
# Ontario Economic Review

January/February 1970  
Volume 8, Number 1

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister



HA  
747  
0656  
1970  
VOL. 8  
NO. 1

## The Ontario Economy

## The Input-Output Structure of the Ontario Economy

R. H. Frank, S. M. Batrik and D. Haronitis

Department of Treasury and Economics

## Selected Economic Indicators

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. Charles S. MacNaughton  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario

### About the Review

The January/February edition of the *Ontario Economic Review* presents an article on the recently completed input-output table for the Ontario economy. Essentially a method of recording detailed statistical information in the form of a table or matrix, an input-output model is of significant value in measuring the impact of changes in final demand for the product of each industry upon the various levels of economic activity within the province.

The first section of this article outlines the conceptual framework of the Ontario input-output model and provides a concise exposition of the underlying methodology. The three basic matrices — the interindustry flow table, the matrix of input-output coefficients and the inverse representing the total requirements table — are examined in the second part of the study and presented in tabular form in the Appendix. The final section provides a summary of the statistical data sources and supplementary estimating procedures used in the construction of the model.

This article was prepared by Mr. R. H. Frank, Director of the Economic Analysis Branch together with Mr. S. M. Batrik and Mr. D. Haronitis of the unit's Input-Output Section within the Economic and Statistical Services Division. The Department also wishes to express its appreciation for the technical advice provided by the Dominion Bureau of Statistics, Quebec Bureau of Statistics and the Advanced Systems Division of the IBM Corporation, Washington D.C., which contributed significantly to the project, particularly its programming aspects.

### Indicator Charts, Pages 34-36

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 34-36 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## The Ontario Economy in 1969 and 1970

Looking back over the past year, the performance of Ontario's economy has been both gratifying and disappointing. Gratifying in that unemployment has remained relatively low, productivity has again increased, and incomes have jumped to record highs. Disappointing because inflation, a problem present at the start of 1969, is still unchecked as we enter 1970.

Despite the disruptive impact of inflation and strikes — both of which played a significant role in the economy in 1969 — Ontario enjoyed a reasonable measure of growth and prosperity. An exact measure of the economy's performance has not yet been obtained but indications are that gross provincial product, the total value of final goods and services produced, increased by 9.6 per cent over 1968. This means that the GPP advanced to \$31.5 billion (on the new national accounts basis) from \$28.7 billion in 1968. Prices increased 4.3 per cent and real growth 5.1 per cent. Wages and salaries in Ontario recorded a sizable gain of approximately 12 per cent, while the increase in corporation profits was a more moderate 7 per cent.

Substantial growth in the size of the labour force was surpassed by a 3.8 per cent increase in employment, from 2,830,000 in 1968 to 2,937,000 in 1969, lowering the rate of unemployment to 3.2 per cent from 3.5 per cent in 1968.

The Canadian and Ontario economies did not follow the path predicted early in the year. An anticipated smooth and gentle deceleration from the high rate of growth at the start of 1969 did not materialize. Instead, a series of labour disputes ranging from a costly Toronto construction industry strike-lockout to prolonged strikes in mining and steel manufacturing cut growth severely throughout the summer and autumn. As a result well over one million man-days of output were lost in these specific areas alone. In the closing months of the year there was some recovery, although strict anti-inflationary measures probably moderated this revival of growth.

To understand the cyclical setting for 1970, it is advisable to look back at the economy early in 1969. Canada entered the year with the economy expanding at a clearly excessive pace. This was accompanied by substantial price increases.

A full range of anti-inflationary measures were already in operation, not only in Canada but also in the United States, where

similar problems confronted the economy. In the U.S. credit restraints were tightened which added to the bite imposed by the ten per cent income tax surcharge and other fiscal measures. In Canada, governments at all levels attempted to exercise budgetary restraint since the growth of the service sector (of which government is a part) was a prominent factor in inflation trends. The Government of Ontario struck out against inflation by holding down its spending, despite relentless pressures for further expenditure growth. The federal government imposed the social development tax and kept monetary policy tight.

In the United States, restrictionist policies gradually began to produce a noticeable dampening of the economy's inflationary tendencies. Real economic growth declined steadily, extending the pattern of deceleration started in the autumn of 1968. By the third quarter of 1969, the U.S. growth rate was down to two per cent. Although unemployment rose to four per cent, price pressures were still very strong.

In Canada, efforts to effect a systematic transition to slower growth rates were undermined by labour disputes. While a smooth deceleration might have been forthcoming, the added burden of strike activity reduced economic growth in the second quarter of 1969 to a standstill. Manufacturing, mining and construction were particularly hard hit. The third quarter of the year saw only a mild recovery. Weaknesses also appeared elsewhere in the economy, particularly in housing starts and in exports.

This pattern of growth carried over into the mid-summer months of 1969, as the economy was still plagued by labour disputes. In addition to strikes in construction, nickel and iron ore, an 80-day work stoppage at Stelco seriously hampered the growth of industrial output by interfering with the flow of basic steel and steel products.

An unsatisfactory level of industrial output was accompanied by continued weakness in housing construction. Urban housing starts in Ontario, seasonally adjusted at annual rates, declined to 58,600 and 65,500 in the second and third quarters respectively after reaching a level of 97,000 units in the first quarter of 1969. Nevertheless, in the period January-September, the total number of starts was 8.6 per cent higher than in the corresponding time-span in 1968. However, Toronto, which accounts for roughly half of all urban housing starts, recorded a loss

of approximately 6.9 per cent. Starts in most other major urban areas were up in varying degrees with Ottawa, Windsor, Oshawa and Sudbury experiencing particularly large increases. For the year 1969 as a whole, housing starts for all areas of Ontario were approximately 80,700 as compared with 80,375 in 1968.

Business investment followed a unique path during 1969. Surveys indicated bullish intentions throughout most of the year, at first seemingly in response to the need to "catch up" and to the favourable surge in profits at the close of 1968, but later apparently due to fears of further inflation. Only recently has it come to light that strikes in construction and tight financial conditions resulted in some postponements of projects. Still, a marked overall gain was recorded in Ontario.

Substantial increases in non-residential construction prices, a succession of very high wage increases and price rises elsewhere in the economy heightened concern over inflation throughout the year, despite some signs of moderation in the pace of economic activity. In June, discriminatory federal tax penalties were imposed upon construction of commercial buildings in urban centres. This policy affected Ontario in particular. However, weaknesses in construction activity appear to have resulted from labour problems and financing difficulties rather than tax measures.

The question of inflation received top priority during the year. Just after mid-year, the newly established Prices and Incomes Commission issued a series of proposals for voluntary price restraint on the part of industry, government and labour. This voluntary approach did not show any immediate signs of achieving acceptance. Negotiated wage increases remained at a high annual rate of approximately eight per cent. The annual increases in the consumer price index reached five per cent at mid-year and later settled back to a still-inflationary level in excess of four per cent.

Early in the summer months the rapid ascent of meat prices attracted considerable attention as the index for food rose over two per cent from May to June. Although beef prices settled down soon thereafter, food prices remained high relative to the previous year. A large price increase was recorded for the year in the wholesale price index as well. Near year-end settlement of the steel strike appeared to trigger increases in selected steel



prices. These continuing price pressures prompted the federal government to hint that price and wage controls as well as further tax measures would be considered if the current rate of inflation continued.

Ontario's strength in 1969 came from residential construction activity and exports, even though both sectors showed distinct signs of weakening throughout the year. The estimated value of actual housing expenditure was \$1.3 billion in accordance with earlier investment intentions. Exports for Canada as a whole were 9.5 per cent higher than last year; retail trade in Ontario increased by more than eight per cent.

Turning to the outlook for 1970, one major issue divides forecasters on the current state of the North American economy. While most agree that growth will once again decelerate under the weight of anti-inflationary monetary and fiscal policies, the argument revolves around the degree of deceleration and unemployment which will accompany it. In the U.S., some suggest that the economy has already entered a period of no economic growth, while others expect that the current pause is just that, a

pause, to be followed by a resumption of economic growth later in 1970.

The economic climate in the United States is very important to Canada and Ontario since we rely heavily on exports to the U.S. and depend upon favourable conditions in foreign markets generally. In addition, changing monetary policies both in Canada and the U.S. will have important repercussions for us.

Estimates of the growth of real output in the United States in 1970 range from zero to nearly four per cent. On the whole, however, it appears that U.S. growth will cease over the first half of 1970, but will recover at mid-year, achieving an overall growth rate of approximately two per cent. Price pressures may begin to ease about that time.

Canada will probably not face a slowing of economic growth to the same extent in the first half of 1970, primarily because we have already gone through one downward readjustment in mid-1969. After experiencing a modest revival of economic growth in the fourth quarter of 1969, the first two quarters of 1970 should see a return to a positive but reduced rate of economic growth. If the U.S. can weather its pause without too much difficulty, Canada should continue to enjoy

some forward momentum in the economy. Throughout this period it is expected that Canadian monetary and fiscal policies will continue to maintain an anti-inflationary stance — perhaps in the face of steadily rising unemployment. If so, a basis for future economic moderation may be established before economic growth begins to increase once again. Prices will still, however, continue to rise over 1970 and it may not be until early 1971 that any significant reduction can be anticipated.

By mid-year, the U.S. economy will reverse its downward trend as an easing of monetary policy and the termination of the five per cent income tax surcharge lead to a resumption of economic growth. Corresponding easing in the monetary picture in Canada, along with some improvement in export prospects, should also produce a shift to acceleration in economic activity.

If economic dislocation is minimal during the critical transition period of 1970, Ontario can expect a rate of economic growth of approximately 7.2 per cent in 1970. Prices should account for approximately 3.9 per cent of this increase while the volume of real output should rise by about 3.3 per cent.

#### The Consumer Price Index<sup>1</sup>, Canada, Ottawa and Toronto, December 1969/December 1968

	All Items	Food	Housing	Clothing	Transportation	Health and Personal Care	Recreation and Reading	Tobacco and Alcohol
<b>Canada</b>								
1969	127.9	129.8	127.6	126.4	122.0	136.8	128.1	126.3
1968	122.3	124.5	121.0	123.4	115.7	129.4	123.3	121.3
% Change	4.6	4.3	5.5	2.4	5.4	5.7	3.9	4.1
<b>Ottawa</b>								
1969	125.8	131.1	117.1	128.5	120.0	139.8	135.6	132.2
1968	120.2	125.2	111.5	124.8	116.9	131.8	125.6	125.1
% Change	4.7	4.7	5.0	3.0	2.7	6.1	8.0	5.7
<b>Toronto</b>								
1969	126.6	129.9	119.8	130.1	128.2	135.3	124.2	130.2
1968	121.5	123.8	116.5	127.2	119.5	128.8	120.3	123.6
% Change	4.2	4.9	2.8	2.3	7.3	5.0	3.2	5.3

<sup>1</sup>Based on 1961 = 100.

Source: DBS, Price Movements.



R. H. Frank, S. M. Batrik and D. Haronitis  
Department of Treasury and Economics

Reflecting the increasing need for detailed quantitative analyses of major sectors of the Ontario economy, the Economic Analysis Branch of the Economic and Statistical Service Division has initiated a continuing econometric program designed for the formulation and testing of economic models which incorporate both forecasting and policy evaluation features.

During the past two years, the Division's economic research activity has concentrated on the development of an input-output table for the province and the design of a system of provincial economic accounts to be integrated subsequently with an econometric model.

The present study describes in detail the recently completed input-output table which portrays the intricate structural framework of Ontario's economy in terms of interindustry flows of goods and services and their interaction with the final demand sector.

The first section of this article outlines the conceptual framework of the Ontario input-output model and provides a concise exposition of the underlying methodology. The three basic matrices — the interindustry flow table, the matrix of input-output coefficients and the inverse representing the total requirements table — are examined in the second part of the study and presented in tabular form in the Appendix. The final section provides a summary of the statistical data sources and supplementary estimating procedures used in the construction of the model.

## I THE ONTARIO INTERINDUSTRY MODEL

Input-output analysis is essentially a method of recording detailed statistical information in the form of a table or matrix, which portrays the flow of goods and services among the various sectors of the economy. The first step in constructing an interindustry table is to divide the economy into a number of sectors on the basis of input and/or output homogeneity. The sectors are then arranged in the same order along the rows and columns of the table. The second step is to fill in the cells of the table by utilizing available statistical information. Each row of the table indicates the total output of each sector and its distribution among various other sectors to meet intermediate and final demand. Each column indicates the inputs required by each sector to produce a given

level of output. The interindustry model is based on two fundamental identities. The first is that the total output of an industry — the sum of each row — is equal to its total input — the sum of each column. The second identity is that the sum of the primary inputs — wages and salaries and other value added — is equal to the sum of the final demands.

The Ontario input-output model can be represented by a set of equations as follows: let  $x_{ij}$  denote the output of sector  $i$  used as input by sector  $j$ ;  $Y_i$  domestic final demand for the product of sector  $i$ ;  $X_i$  total production of sector  $i$ ;  $E_i$  and  $M_i$  total exports and imports of the product of sector  $i$  respectively, then:

$$x_{i1} + x_{i2} + \dots + x_{in} + Y_i + T_i = X_i$$

or

$$(1) \sum_j x_{ij} + F_i = X_i \quad (i, j = 1 \dots n)$$

where  $T_i = E_i - M_i$  denotes the net trade balance of the product of sector  $i$  and  $F_i = Y_i + T_i$  represents total final demand for the product of sector  $i$  net of imports.

Equation (1) shows that the total output of sector  $i$  is equal to the amount of product  $i$  used by itself and various other sectors as input plus the amount delivered to final consumers. Summing over all  $i$ , we obtain:

$$(2) \sum_i \sum_j x_{ij} + \sum_i F_i = \sum_i X_i$$

Equation (1) was obtained by summing the row elements of the matrix. If we sum the column elements we can write:

$$x_{1j} + x_{2j} + \dots + x_{nj} + V_j = X_j$$

or

$$(3) \sum_i x_{ij} + V_j = X_j$$

where  $V_j$  represents the value added generated by sector  $j$ , which includes wages and salaries, profits, dividends etc., and  $X_j$  denotes total inputs used by sector  $j$ . Summing equation (3) over all  $j$  yields:

$$(4) \sum_j \sum_i x_{ij} + \sum_j V_j = \sum_j X_j$$

Combining equations (2) and (4) we can derive the provincial accounts identity:

$$(5) \sum_j V_j = \sum_i F_i$$

since

$$\sum_i X_i = \sum_j X_j \quad \text{and} \\ \sum_j \sum_i x_{ij} = \sum_i \sum_j x_{ij}$$

The left-hand side of equation (5) shows total payments to factors of production or gross provincial income, whereas the right-hand side represents total expenditure on goods and services or gross provincial product. Hence gross provincial income equals gross provincial product (net of imports). Interindustry transactions are eliminated in provincial accounting and may be described as non-GPP items.

The input-output matrix as formulated in equations (1) to (5) represents a static equilibrium model in the sense that its variables balance out, without surplus or deficit — as indicated in equations (1) and (3) — and reflects the structure of the economy at a given point of time. Demand balances supply at the price and/or income of the static equilibrium position.

Within the context of the Ontario model it is assumed that the national price index for commodity  $i$  during 1965 represents the equilibrium price for that year.

The usefulness of an input-output model is basically twofold. In the first place, the interindustry table serves as a device for storing important information concerning the structure of production and the interdependency of the various producing sectors in the economy. Secondly, the input-output model can be used to estimate total output requirements necessary to meet final demand targets by solving the system of equations (1) for the output vector  $\mathbf{X}$ .

Before proceeding to the solution of the input-output model it is necessary to state explicitly the basic underlying assumptions:

(a) It is assumed that each productive sector produces a single commodity, which implies that joint production is ruled out. However, in practice this assumption is not met as each sector frequently produces two or more products, one of which is primary while the rest are secondary to the main activity. Hence, to implement this assumption it is necessary to adjust sectoral output by transferring the secondary products of each sector to those sectors to which they are primary<sup>1</sup>.

<sup>1</sup>The method of adjustment used in the Ontario model is described below.



(b) The production function which relates the output  $X_j$  of the  $j$ th sector to its inputs  $x_{ij}$  is assumed to be homogeneous of degree one, which implies that constant returns to scale prevail in the production process.

(c) The final assumption states that each input  $x_{ij}$  is required in fixed proportion to output. Hence we can write:

$$(6) \quad x_{ij} = a_{ij} X_j$$

The fixed coefficients  $a_{ij} = x_{ij}/X_j$  indicate the input units required per output unit, and represent the state of technology in the economy.

In addition to the basic assumptions stated, the following conditions or constraints must be satisfied to ensure internal consistency of the model.

(a) It is necessary that the net output of each producing sector be non-negative. The net output of the  $i$ th sector is defined as the difference between gross output  $X_i$  and the sectors intermediate demand for its own product denoted by  $x_{ii}$ .

Hence:

$$(7) \quad X_i - x_{ii} \geq 0 \text{ for all } i$$

It is possible that the entire output of a particular sector is absorbed as input in the production process. However, within the framework of a static equilibrium model, such as the Ontario input-output table, it is inconsistent for intermediate demand of sector  $i$  for its own product to exceed the sector's gross output.

(b) It is implicit from equation (7) that  $a_{ii} < 1$  i.e. the feedback coefficients<sup>1</sup> must be less than unity.

Under these assumptions the solution of the model can be derived as follows: by rearranging the set of equations (1) and substituting  $x_{ij} = a_{ij} X_j$  from equation (6) we obtain:

$$(8) \quad \begin{aligned} (1 - a_{11}) X_1 - a_{12} X_2 - \dots - a_{1n} X_n &= F_1 \\ -a_{21} X_1 + (1 - a_{22}) X_2 - \dots - a_{2n} X_n &= F_2 \\ \cdot &\cdot \\ \cdot &\cdot \\ \cdot &\cdot \\ -a_{n1} X_1 - a_{n2} X_2 - \dots + (1 - a_{nn}) X_n &= F_n \end{aligned}$$

In matrix notation this may be written as:

$$(9) \quad \begin{bmatrix} (1 - a_{11}) & -a_{12} & \dots & -a_{1n} \\ -a_{21} & (1 - a_{22}) & \dots & -a_{2n} \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ -a_{n1} & -a_{n2} & \dots & (1 - a_{nn}) \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ \cdot \\ \cdot \\ X_n \end{bmatrix} = \begin{bmatrix} F_1 \\ F_2 \\ \cdot \\ \cdot \\ F_n \end{bmatrix}$$

or

$$(10) \quad (\mathbf{I} - \mathbf{A}) \mathbf{X} = \mathbf{F}$$

where  $\mathbf{I}$  is the identity matrix of order  $(n \times n)$  while  $\mathbf{A}$  is the  $(n \times n)$  square matrix of technical coefficients;  $\mathbf{X}$  is the  $(n \times 1)$  vector of sectoral output levels and  $\mathbf{F}$  is the  $(n \times 1)$  vector of total final demands. Assuming that  $|\mathbf{I} - \mathbf{A}| \neq 0$  and premultiplying equation (10) by  $(\mathbf{I} - \mathbf{A})^{-1}$  the solution of the model is given by:

$$(11) \quad \mathbf{X} = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{F}$$

If the final demand vector  $\mathbf{F}$  is determined exogenously, equation (11) yields the total output vector  $\mathbf{X}$ , i.e., the level of production required by each sector to satisfy a given final demand target.

### Net Trade Balance

Due to lack of statistical information on interprovincial and international trade flows, the net trade balance for each sector was estimated as a residual item by making use of the balance equation (1), which can be written as:

$$(12) \quad T_i = X_i - \left( \sum_j x_{ij} + Y_i \right)$$

The sum of intermediate demand,

$$\sum_j x_{ij}$$

and domestic final demand  $Y_i$  provides an estimate of total output that must be produced by sector  $i$  to meet direct and indirect requirements of the Ontario economy. These estimated total output requirements are compared with actual total output  $X_i$ , the difference being the net trade balance,  $T_i$ , for the product of sector  $i$ . A positive value of  $T_i$  indicates that the province is a net exporter of product  $i$ , whereas a negative value shows that the province is a net importer of that product.

### Valuation Problem

One of the major problems arising in the construction of an input-output table is the valuation of distributive costs for wholesale and retail trade, transportation and storage. For purposes of interindustry analysis, there are two alternative valuation methods for distributing trade and transportation margins among all sectors of the economy, namely, the producers' price system and the purchasers' price system. In the producers' price system, each sector is treated as paying trade and transportation costs directly to the trade and transportation sectors on all its purchases of inputs. Hence, within the conceptual framework of this method, distribution costs are charged to the purchasers of commodities. In the purchasers' price system, on the other hand, trade and transportation costs are allocated directly to the producers of each commodity.

Adopting the producers' price system requires that the value of all inputs as recorded in the Census of Manufactures be adjusted accordingly. However, due to lack of information on distributive costs, it was assumed that the national ratios of the cost items to the purchaser value of each product are applicable to Ontario. The method of conversion is summarized in the following equations:

Let  $\mathbf{Z}^* = [z^*_{ij}]$  represent the national input-output matrix valued at purchasers' prices,

<sup>1</sup>The feedback coefficient  $a_{ii}$  of sector  $i$  is defined as the amount of its own output required as input for producing one unit of output.



and  $Z = [z_{ij}]$  the same matrix valued at producers' prices. Then:

$$D = Z^* - Z$$

where  $D = [d_{ij}]$  represents the distributive costs and all other margins which are included in the  $i$ th product and purchased by sector  $j$ .

Dividing each element of matrix  $D$  by the corresponding element of matrix  $Z^*$  the matrix  $R = [r_{ij}]$  is derived representing the ratios of the total value of distributive costs and trade margins to the value of each product at purchasers' prices.

Under the assumption that  $R = K$ , where  $K = [k_{ij}]$  is the total margins coefficients matrix for Ontario, the aggregate value of trade and transportation margins for each industry was estimated by multiplying each element of the matrix  $K$  by the corresponding element of the Ontario input-output matrix, valued at purchasers' prices and denoted by  $X^* = [x^*_{ij}]$ . Thus, the derived Ontario table at producers' prices, denoted by  $X = [x_{ij}]$  is represented by the following equation:

$$\begin{bmatrix} x^*_{11}(1 - k_{11}) + x^*_{12}(1 - k_{12}) + \dots + x^*_{1n}(1 - k_{1n}) \\ \vdots \\ x^*_{n1}(1 - k_{n1}) + x^*_{n2}(1 - k_{n2}) + \dots + x^*_{nn}(1 - k_{nn}) \end{bmatrix} = X$$

The total value of these margins,

$$\sum_i x^*_{ij} k_{ij}$$

for sector  $j$  was subsequently disaggregated into the trade margin and transportation costs, using the national ratio of each component to the total.

### Secondary Products

The Census data are compiled on the basis of the Standard Industrial Classification which defines each industry in terms of a group of establishments engaged in the production of a principal commodity. However, many establishments within an industry frequently produce secondary products which are primary to other industries. In order to ensure homogeneity of the sectoral production functions, it is imperative that the secondary products be identified and reallocated.

The ideal method for the reallocation of secondary products is to transfer them to the industries within which they are considered, by definition, primary products. As the

transfer of secondary products results in a change of the input structure this would necessitate a modification of the input distribution of the table to account for the inputs used in the production of secondary products. Since the data required for the implementation of this method are not available, only the output adjustments were feasible. The secondary products are reallocated as inputs to the industries for which they are primary and simultaneously added to the output of these industries. In fact, this procedure deals with secondary products as though they were purchased and made available for distribution by the primary industry. It should be noted that this limited adjustment procedure has also been used in the construction of the input-output model of the United States and other countries.

## II DESCRIPTION OF THE BASIC TABLES

The input-output technique of organizing and analyzing the massive economic data

available reveals in synoptic fashion the basic economic variables and their interrelationships. It presents in quantitative form the complexity of the Ontario economy and its advanced industrial base with virtually every type of economic activity represented. In addition, the model reveals not only the diversity of the Ontario economy, but also the high degree of interdependency among different sectors.

Three basic tables of the Ontario input-output model — the transactions flow matrix, the direct requirements and the total requirements tables — are presented in the Appendix of this article.

### Transactions Flow Table

Table I shows in thousands of 1965 dollars all the economic transactions in Ontario for that year. Each entry represents a sale or purchase depending on whether the table is read by row or column. The row entries of the table show how the output of a particular sector was distributed to all other in-

dustries and final consumers in the economy. The direct relationship between the production of an industry and its sales to final users varies considerably. For example, while the motor vehicle industry sells close to 70 per cent of its total output to final users, the mining industry delivers over 70 per cent of its output to other industries as raw material or intermediate input. In some industries the value of total output is not sufficient to satisfy the intermediate demand of other industries. For example, total intermediate demand for the output of synthetic textiles (No. 15) amounts to \$123 million, while total provincial output of this industry is \$59 million with the difference compensated for by imports either from other provinces and/or the rest of the world.

As shown in Table I, 20 industries out of 49 sell over 50 per cent of their total output to final consumers. It is essential for economic policy planning not only to distinguish between intermediate and final users of the output of each sector, but also to identify the individual recipient sector. It should be noted that there are considerable differences among sectors in the degree of diversity of their intermediate market pattern. For example, while grain mills (No. 5) and utilities (No. 47) both sold over 50 per cent of their production to other industries, the latter sold its output to almost every sector, while grain mills delivered their output to a very small number of industries. Thus, the intermediate market pattern shown in the Ontario input-output table reflects the demand, price levels and product-mix existing during the base year.

While the row entries in the flow table show the output distribution for each sector, the columns for each sector indicate the amount of inputs required from all other sectors as well as the amount of productive factors needed to produce a given level of output. For example, the iron and steel industry (No. 25), required \$118 million of mineral products, \$194 million of its own product and \$15 million of services, etc. to produce \$1,025 million of steel and iron products.

### Direct Requirements Table

Table II in the Appendix relates each of the inputs of an industry to its total output. The structure of production of an economic system, as represented by the direct requirements table, reflects essentially the underlying technology of the economy. The entries



shown in the table are therefore referred to as "technical coefficients".

Each column in Table II shows the inputs that the industry named at the top of that column required from other industries to produce a dollar's worth of output. For example, to produce a dollar's worth of output, the iron and steel industry (No. 25) requires 11 cents worth of products from the mining industry (No. 2), 19 cents worth of its own production, and services valued at 14 cents, etc.

The information contained in Table II reflects the complex nature of Ontario's economic structure. Almost all industries require inputs from at least 20 different industries. Further insight into the industrial interdependence may be gained by examining the feedback coefficients which represent that portion of the output of a particular sector used in its own production. The higher the value of input produced within the same industry the lower the degree of interaction the industry has with other sectors. For example, the agricultural sector produces 33 per cent of its own requirements while the trade, transportation and storage industries supply only 10 per cent of their own input requirements.

The accompanying table shows the entries on the principal diagonal with a ranking of the sectors according to their degree of specialization and interdependency.

#### Structural Inverse Matrix

While the direct requirements table indicates how much is required by different industries to produce a dollar's worth of output, the structural inverse matrix shows the amount of output required both directly and indirectly from the industry named in each row for each dollar of deliveries to final demand by the industry named at the head of the column. This table thus permits a quantitative evaluation of the impact of induced changes in final demand on the various industries of the economy.

Although the structural inverse matrix is more convenient for calculating total requirements, the direct requirements table is sometimes preferred since it permits flexibility in computation and allows for modification of the underlying relationships. In addition, Table II can be used in conjunction with Table III to split the total requirements into their direct and indirect components. For example, the direct effect of a unit change in final demand for food products is obviously one dollar. However, as the structural matrix

**Ranking of Ontario Industries By Percentage of Total Output Consumed Within the Producing Industry, 1965**  
(Valued at Producers' Prices in \$000)

			Intra- industry Consumption	Total Output	Intra- industry consumption Percentage of Total Output
I-O Rank	No.	Industry			
1	26	Other Primary Metals Industries	244,322	745,129	32.79
2	14	Cotton Yarn and Cloth	17,230	58,742	29.33
3	31	Motor Vehicles and Aircraft	1,011,110	3,486,792	29.00
4	19	Sawmills	24,367	84,206	28.94
5	22	Pulp and Paper Mills	152,323	586,059	25.99
6	7	Sugar and Confectioneries	37,207	144,404	25.77
7	3	Meat and Poultry	140,766	641,117	21.96
8	23	Paper Products	92,094	437,824	21.03
9	13	Leather and Leather Products	34,731	178,063	19.50
10	4	Dairy Products	91,401	474,177	19.28
11	38	Other Non-metallic Mineral Products	41,128	221,148	18.60
12	18	Other Textile Mills	65,449	353,138	18.53
13	25	Iron and Steel Mills	194,655	1,051,243	18.52
14	47	Utilities	88,461	484,700	18.25
15	43	Other Chemical Industries	170,628	992,485	17.19
16	8	Other Food Industries	131,880	796,498	16.56
17	32	Other Transportation Equipment	26,937	163,802	16.44
18	11	Tobacco and Tobacco Products	24,968	172,462	14.48
19	12	Rubber Products	53,289	387,082	13.77
20	35	Communication Equipment	71,906	546,021	13.17
21	37	Clay, Lime and Cement	39,999	309,985	12.90
22	15	Synthetic Textiles	21,648	203,897	10.62
23	21	Other Wood Industries	17,605	172,441	10.21
24	48	Communications and Other Services	605,626	6,843,310	8.85
25	44	Miscellaneous Manufacturing Industries	44,552	541,845	8.22
26	39	Petroleum Refineries and Coal Products	44,639	567,456	7.87
27	29	Other Metal Fabricating Industries	126,496	1,641,560	7.71
28	40	Plastics and Synthetic Resins	13,283	175,331	7.58
29	1	Agriculture, Forestry and Fishing	113,606	1,706,750	6.66
30	46	Transportation, Storage and Trade	272,076	4,148,317	6.56
31	5	Grain Mills	17,083	295,328	5.78
32	41	Paint and Varnish	6,765	120,334	5.62
33	2	Mining	44,924	830,380	5.41
34	17	Clothing Industries	10,479	262,133	4.00
35	16	Knitting Mills	4,299	121,548	3.54
36	24	Printing and Publishing	20,123	584,097	3.45
37	10	Distilleries, Breweries and Wineries	9,788	288,876	3.39
38	20	Furniture and Fixtures	8,273	262,863	3.15
39	42	Pharmaceuticals and Medicines	3,810	127,220	2.99
40	36	Other Electrical Equipment	3,368	189,909	1.77
41	30	Miscellaneous Machinery	6,233	488,866	1.27
42	33	Electrical Appliances	2,746	319,529	0.86



**Ranking of Ontario Industries By Percentage of Total Output Consumed Within the Producing Industry, 1965 (continued)**  
(Valued at Producers' Prices in \$000)

Rank	I-O No.	Industry	Intra-industry Consumption	Total Output	Intra-industry Consumption as a Percentage of Total Output
43	34	Electrical Industrial Equipment	660	364,983	0.18
44	45	Construction, Maintenance and Repair	1,811	3,176,718	0.06
45	28	Metal Stamping, Pressing and Coating	15	416,656	*
46	6	Biscuits and Bakeries	0	231,685	0.00
47	9	Soft Drinks	0	81,209	0.00
48	27	Fabricated and Structural Metals	0	199,779	0.00
	49	Unallocated Sector	0	1,899,505	0.00

\*Less than 0.01 per cent.

reveals, the total effect on this sector is 1.2 dollars.

The table on page 8 presents the results obtained from the structural matrix and shows each industry ranked by its degree of interdependency with the remaining sectors of the economy. Thus, it indicates the composite effect of a change in final demand for the product of each sector on the total output level of the economy. An increase of one million dollars in the demand for the output of the cotton clothing industry (No. 14) will require an increase of 1.4 million dollars in the industry's output level and will generate an additional demand of approximately 1.2 million dollars for products of other industries. Hence, the total requirements for satisfying a unit increase in demand for the product of this sector are 2.6 units in terms of total output of the economy. A comparison with the pulp and paper sector, for example, shows that the cotton clothing industry has a higher degree of interdependency in the sense that the effects generated in the economy by a change in the level of demand for the products of this sector are larger than the effects induced by a comparable change in the pulp and paper industry.

These production impact multipliers can be supplemented by an analysis of derived labour requirements on the basis of labour-output ratios. Thus, the direct and indirect effects on the level of employment can be estimated for any change in the level of gross provincial product or its components. In addition, the input-output technique can be

used for analyzing the impact of price changes on the economy.

#### Construction of the Transaction Flow Matrix

While the conceptual framework and the basic design of the input-output model involves the application of purely mathematical techniques, the construction of the component matrices requires the compilation and processing of a massive volume of data from a multiplicity of statistical sources.

In compiling an interindustry flow table, there are two major methodological approaches: the first involves tracing the flows of different commodities to ultimate users both by intermediate and final consumers resulting in completion of the matrix by rows. The second method — the cost approach — involves recording the inputs used by the different sectors and allows construction of the table by columns. The choice between these two methods depends mainly on the type of available data and their level of detail. The principal source of data, particularly for the manufacturing sectors which constitute the major part of the table, is the Annual Census of Manufactures. These data compiled by the Dominion Bureau of Statistics provide information on the inputs of raw materials and supplies used by establishments operating in the same industry. Consequently, the second approach was adopted for constructing the Ontario input-output table.

The Ontario table divides the provincial economy into 49 productive sectors: 42 manufacturing sectors, mining, construction,

trade and transportation including storage, two service sectors, agriculture and related activities and one unallocated sector.<sup>1</sup> This sectoral classification was chosen on the basis of the Standard Industrial Classification and the availability of data, especially on non-manufacturing sectors. However, the worksheets upon which the final tables are based were originally developed for 250 sectors.

The work of assembling the table was divided into three major stages:

1. Definition and measurement of the output of each sector in the provincial economy. For some sectors sufficient data exist to permit direct estimation of gross output. For other sectors however, output data were not available and indirect estimating procedures were applied.
2. Estimation and allocation of inputs by sector. Inputs consist of intermediate inputs of raw materials and services used in the production process and primary inputs such as labour costs and capital costs, etc. Since the information available on primary inputs pertains to wages and salaries only, the other items were derived by using a residualizing technique. When information on the distribution of inputs for any sector was unavailable, the national input coefficients for 1961 were assumed to apply to Ontario.
3. Estimation of final demand for the products of each sector by type of final user. While the intermediate part of the table shows the output produced and consumed within the productive system, the final demand sector shows the output of each industry delivered outside the system to final users in both Ontario and the rest of the world. The final demand sector is divided into five major categories:
  - a) Personal consumer expenditure on goods and services.
  - b) Gross provincial capital formation.
  - c) Changes in inventories of:
    - (i) Finished goods and goods in process.
    - (ii) Raw materials and supplies.
  - d) Government expenditures:
    - (i) Ontario provincial government expenditure on goods and services (Current Account).

<sup>1</sup>This version represents a condensation of a larger matrix consisting of 130 sectors. Under the Ontario Statistics Act, the table can be published only in aggregated form in order to comply with confidentiality requirements.



**Ranking of Industries on the Basis of Effects Generated by a One-Dollar Increase in Final Demand**  
(Dollar Value)

Rank	I-O No.	Industry	Total Requirements	Effects on the Same Industry	Effects on All Other Industries
1	40	Plastics and Synthetic Resins	3.40155	1.11515	2.28640
2	3	Meat and Poultry	3.07334	1.29463	1.77871
3	8	Other Food Industries	2.95230	1.22050	1.73180
4	4	Dairy Products	2.94193	1.24305	1.69888
5	5	Grain Mills	2.90289	1.11580	1.78709
6	39	Petroleum Refineries and Coal Products	2.78940	1.10870	1.68070
7	41	Paint and Varnish	2.75407	1.06584	1.68823
8	13	Leather and Leather Products	2.72645	1.24334	1.48311
9	11	Tobacco and Tobacco Products	2.69206	1.16928	1.52278
10	44	Miscellaneous Manufacturing Industries	2.64495	1.11662	1.52833
11	36	Other Electrical Equipment	2.63150	1.02309	1.60841
12	23	Paper Products	2.61479	1.27793	1.33686
13	14	Cotton Yarn and Cloth	2.61078	1.44420	1.16658
14	16	Knitting Mills	2.60634	1.03690	1.56944
15	6	Biscuits and Bakeries	2.60106	1.00103	1.60003
16	43	Other Chemical Industries	2.59661	1.25476	1.34185
17	31	Motor Vehicles and Aircraft	2.58164	1.41744	1.16420
18	12	Rubber Products	2.57166	1.16684	1.40482
19	7	Sugar and Confectioneries	2.56302	1.35081	1.21221
20	42	Pharmaceuticals and Medicines	2.55686	1.03327	1.52359
21	15	Synthetic Textiles	2.54385	1.15116	1.39269
22	26	Other Primary Metals Industries	2.54014	1.51885	1.02129
23	33	Electrical Appliances	2.51910	1.00941	1.50969
24	18	Other Textile Mills	2.51322	1.26007	1.25315
25	32	Other Transportation Equipment	2.49556	1.20000	1.29556
26	35	Communication Equipment	2.45181	1.15447	1.29734
27	29	Other Metal Fabricating Industries	2.42997	1.12202	1.30795
28	28	Metal Stamping, Pressing and Coating	2.42638	1.00383	1.42255
29	17	Clothing Industries	2.38605	1.04237	1.34368
30	20	Furniture and Fixtures	2.35764	1.03304	1.32460
31	9	Soft Drinks	2.35378	1.00073	1.35305
32	38	Other Non-metallic Mineral Products	2.33476	1.23213	1.10263
33	21	Other Wood Industries	2.32387	1.13363	1.19024
34	34	Electrical Industrial Equipment	2.31389	1.00320	1.31069
35	37	Clay, Lime and Cement	2.22729	1.15233	1.07496
36	19	Sawmills	2.19199	1.43056	0.76143
37	45	Construction, Maintenance and Repair	2.17404	1.01718	1.15686
38	30	Miscellaneous Machinery	2.17071	1.01406	1.15665
39	22	Pulp and Paper Mills	2.13790	1.35914	0.77876
40	1	Agriculture, Forestry and Fishing	2.11372	1.12849	0.98523
41	25	Iron and Steel Mills	2.10318	1.24239	0.86079
42	27	Fabricated and Structural Metals	2.09266	1.00122	1.09144
43	24	Printing and Publishing	2.02703	1.07443	0.95260
44	10	Distilleries, Breweries and Wineries	2.00830	1.03687	0.97143
45	2	Mining	1.97200	1.08057	0.89143
46	46	Transportation, Storage and Trade	1.68667	1.12274	0.56393
47	47	Utilities	1.62275	1.22646	0.39629
48	48	Communications and Other Services	1.58276	1.13676	0.44600

(ii) Municipal government and school boards.

e) Trade balance and federal government expenditure which was derived as a residual item.

### III DEFINITIONS OF OUTPUT AND ALLOCATION OF INPUTS BY SECTOR

#### Agriculture

Total value of agricultural output is defined as including cash receipts from the sale of farm products, value of income in kind — the imputed value of agricultural commodities produced and consumed on the farm — and the value of changes in crop and live-stock inventories.

The intermediate inputs into agriculture and their distribution by industries were obtained from farm operating expenses compiled by the Dominion Bureau of Statistics and the Ontario Department of Agriculture and Food. On the whole, these sources provide adequate data on farm operating expenses in the province consistent with the Ontario input-output classification. In some cases however, operating expenses were further broken down by applying either technical coefficients derived from the 1961 input-output table for Canada or utilizing information collected from other sources.

To arrive at primary inputs into agriculture, wages and salaries were calculated by adding wages of farm labour and imputed wages of farm operators. Imputed wages were estimated by multiplying the number of farm operators by the average annual wage paid to farm labourers.

Other value added items were calculated as the difference between total input or output and total intermediate input plus wages and salaries.

#### Forestry and Fisheries

A control total for the value of output of the forestry and fisheries sector was estimated on the basis of information available from DBS publications, Fisheries Statistics, No. 24-209 and Logging, No. 25-201. The output of this sector is defined to include all forest products, the output of business establishments in services incidental to forestry, and output of fishing establishments operating in Ontario.

Detailed information on the distribution of inputs into this sector is virtually nonexistent. Consequently the input distribution



of the national table was used incorporating adjustments and modifications consistent with the structure of the Ontario sector.

### Mining

Information on mining was derived from the 1965 Annual Census of Mining. The census provides only control totals for value of shipments, raw materials and wages and salaries for twenty mining activities. These were aggregated into eight major sectors and the input distribution estimated on the basis of the national input-output table subject to modification by other collected information.

### Manufacturing

The principal data source on manufacturing was the 1965 Annual Census of Manufactures for the province of Ontario compiled by DBS on the basis of the Standard Industrial Classification. The summary schedules available provide information on raw materials, supplies, purchased components, semi-processed goods, and fuel and electricity used in the production process during the year. In addition, each schedule contains data on value of shipments, changes in inventories of raw materials, finished goods and goods in process and the value of wages and salaries. However, such detailed information is not equally available for all industries due to the reporting system on which the census is based. For example, small establishments are required to report only totals for raw materials purchased and goods shipped.

Supplementing the Census of Manufactures, data from several special DBS surveys were utilized. This information was necessary to ascertain the distribution of the total value of containers and packaging supplies used by each industry and to estimate the value of service inputs into manufacturing sectors.

The first step in constructing the inter-industry flow table for the manufacturing sector required determination of control totals for the value of output produced by each industry. As pointed out earlier, the 1965 Census of Manufactures provides only the value of shipments. It was therefore necessary to adjust these figures for changes in inventories of finished goods in process while further adjustments were required to exclude the value of products purchased and resold without further processing.

Since census information is compiled on an establishment basis additional problems were encountered classifying commodities on the basis of the Standard Industrial Classification. As mentioned above, establishments

within an industry may produce in addition to their principal products, secondary goods which are primary to other industries. The difference between the industrial output classification used in the census and the input-output concept necessitates the identification and reclassification of industrial output and subsequent reallocation to the appropriate

industry. Therefore, a secondary products matrix showing the value of output of each industry and the designation to various producing sectors was constructed. The method followed for adjusting sectoral outputs for secondary products has been discussed in Section II of this article. The following table shows the adjusted value of industrial output

### Ranking of Ontario Manufacturing Industries by Level of Total Output Produced in Ontario, 1965

(Valued at Producers' Prices in \$000)

Rank	I-O No.	Industry	Total Output	Percentage Distribution
1	31	Motor Vehicles and Aircraft	3,486,792	17.9
2	29	Other Metal Fabricating Industries	1,641,560	8.4
3	25	Iron and Steel Mills	1,051,243	5.4
4	43	Other Chemical Industries	992,485	5.1
5	8	Other Food Industries	796,498	4.1
6	26	Other Primary Metals Industries	745,129	3.8
7	3	Meat and Poultry	641,117	3.3
8	22	Pulp and Paper Mills	586,059	3.0
9	24	Printing and Publishing	584,097	3.0
10	39	Petroleum Refineries and Coal Products	567,456	2.9
11	35	Communication Equipments	546,021	2.8
12	44	Miscellaneous Manufacturing Industries	541,845	2.8
13	30	Miscellaneous Machinery	488,866	2.5
14	4	Dairy Products	474,177	2.4
15	23	Paper Products	437,824	2.3
16	28	Metal Stamping, Pressing and Coating	416,656	2.2
17	12	Rubber Products	387,082	2.0
18	34	Electrical Industrial Equipments	364,983	1.9
19	18	Other Textile Mills	353,138	1.8
20	33	Electrical Appliances	319,529	1.7
21	37	Clay, Lime and Cement	309,985	1.6
22	5	Grain Mills	295,328	1.5
23	10	Distilleries, Breweries and Wineries	288,876	1.5
24	20	Furniture and Fixtures	262,863	1.4
25	17	Clothing Industries	262,133	1.3
26	6	Biscuits and Bakeries	231,685	1.2
27	38	Other Non-metallic Mineral Products	221,148	1.1
28	15	Synthetic Textiles	203,897	1.0
29	27	Fabricated and Structural Metals	199,779	1.0
30	36	Other Electrical Equipment	189,909	1.0
31	13	Leather and Leather Products	178,063	0.9
32	40	Plastics and Synthetic Resins	175,331	0.9
33	11	Tobacco and Tobacco Products	172,462	0.9
34	21	Other Wood Industries	172,441	0.9
35	32	Other Transportation Equipment	163,802	0.8
36	7	Sugar and Confectioneries	144,404	0.7
37	42	Pharmaceuticals and Medicines	127,220	0.7
38	16	Knitting Mills	121,548	0.6
39	41	Paint and Varnish	120,334	0.6
40	19	Sawmills	84,206	0.4
41	9	Soft Drinks	81,209	0.4
42	14	Cotton Yarn and Cloth	58,742	0.3
<b>Total</b>			<b>19,487,922</b>	<b>100.0</b>



by sector and the relative share in total manufacturing output for the province of Ontario.

The second step in the analysis of the manufacturing sector involved the construction of a matrix showing the flows of input items purchased and used by each industry in the production process. For most industries, a detailed breakdown of raw materials and fuel and electricity consumed is available from the 1965 Census of Manufactures. Each of these input items was allocated to the industry which produced them as a primary product. It was assumed that other raw materials which could not be allocated to specific producing industries were distributed in the same manner as those inputs specified in the census questionnaires.

As the census schedules do not provide much detail concerning containers and other shipping materials used, the allocation of these items to industry-of-origin was based on a special DBS survey.

### Construction

The construction sector for the interindustry table includes all construction work performed in Ontario during 1965 and carried out either by the construction industry proper or by the labour force of other industries. New construction consists of all new work put in place, including additions, major renovations, conversions and alterations where either structural change takes place or the life of an existing asset is extended. On the basis of this definition a control total for new construction was obtained from the DBS publications, *Private and Public Investment in Canada, 1965* and *Construction in Canada*.

Detailed input estimates for this sector were difficult to obtain. It was assumed that the technical coefficients developed by the Quebec Bureau of Statistics on a sample survey basis for the year 1961 can be applied with modifications based on information collected from the Ontario construction industry.

In order to make this assumption more flexible total new construction in Ontario for 1965 was broken down into approximately thirty types based on the homogeneity of the input patterns applying to each type. As the Quebec construction matrix is valued at 1961 prices, it was necessary to adjust all figures to 1965 prices — the base year of Ontario's table. Multiplying each control total of the thirty types of construction by the corresponding normalized Quebec matrix, a construction matrix for Ontario, in terms of 1965

prices, was derived. By adding all elements across each row, the final column of the input distribution was subsequently obtained.

Due to lack of information repair construction work and its input distribution were estimated by using preliminary data developed by the DBS Input-Output Section on the basis of value judgments and partial information obtained from a limited sample survey.

### Services

The service industries encompass financial intermediaries, repair, amusement, recreational, health, education, personal business and welfare services. The data sources which provide information for the analysis of this sector on a provincial basis are unfortunately very limited. Although data on total receipts and wages by kind of business for particular service industries were available from the 1961 Census of Canada, remaining statistical gaps had to be filled by relying on indirect estimating procedures and on interindustry studies at national level for the year 1961. For some financial intermediaries it was impossible to obtain provincial figures which would enable determination of the total output for this industry. This difficulty arises from the fact that many of these establishments are involved in activities that extend beyond the boundary of any specific province.

As mentioned earlier, the 1961 Census of Canada provides basic information for estimating control totals of output and operating expenses for all service industries except financial intermediaries, health, education and welfare. Consequently, the census data had to be first adjusted to 1965 prices and then projected forward to the base year of the Ontario input-output model.

For personal, business (except financial intermediaries), amusement and recreational services the output levels were measured in terms of gross receipts. The ratios of 1961 to 1965 wages provided by DBS were applied to the census receipts of each subsection to obtain an estimate of the 1965 level of receipts. The implicit assumption underlying this method is that changes in wages between 1961 and 1965 are reflective of changes in receipt levels. As these service industries were analyzed primarily on an activity basis, it was necessary to make certain adjustments to the total value of receipts provided by the census such as the inclusion of all receipts arising from service activities conducted in retail and wholesale trade establishments and the exclu-

sion of all receipts arising from commodity sales in the service area.

The control totals for the value of outputs of other services such as education, health and welfare, and financial intermediaries were estimated by relating them to gross provincial product for 1965. From the national input-output table for 1961 the ratios of total output of each service sector to total value of gross national product were calculated. These ratios were assumed to apply to Ontario.

The final step in the analysis of the service industries was the estimation of total intermediate inputs and their sectoral allocation within the Ontario input-output classification. Due to lack of information on the cost structure of each service sector the national input coefficients were applied to the provincial control totals.

### Trade Sector

As mentioned previously, output of the trade sector is defined as the trade margin. Several attempts were made to estimate the value of provincial output for this sector. However, the estimates generated proved to be unsatisfactory. Consequently, results of the 1961 national input-output study were used on the assumption that the trade markup for a commodity is locationally invariant. These estimates can be considered as reasonable approximations of the provincial trade margins until more comprehensive data become available.

### Transportation and Storage

The transportation and storage sector is defined as including all transportation and storage establishments.

The output of this sector represents the total revenue derived from transporting Ontario's output to users either within or outside the province of Ontario. As in the case of the trade sector adequate information for estimating the total value of output and distribution of inputs was not available. Hence, the national transportation markup derived from the 1961 input-output matrix for Canada, in conjunction with the appropriate trade margins were applied to the Ontario input-output table valued at purchasers' prices. This procedure served a dual purpose: it facilitated the revaluation of the table entry from purchasers' to producer prices and simultaneously permitted estimation of the inputs of these two sectors in each industry of the provincial economy.



## Final Demand Categories

### *Personal Consumption Expenditures*

Following the concepts of national income and expenditure accounts, personal expenditures on goods and services are defined as personal outlays for durable goods, non-durable goods and services. In addition, free board and lodging and all other income in kind are included as if persons received income equal to the value of the goods and services and then purchased these items. Total consumer expenditures for Ontario were available from a special econometric study conducted by the Economic Analysis Branch. Since complete data on consumption patterns by commodities are not available for Canada or Ontario, the value of sales by retail trade establishments in Ontario were utilized as a basis for allocating the total expenditure by household on durable and non-durable goods. The basic information was derived from the 1961 Census of Canada.

Final demand for output of the service sector was estimated either by applying the appropriate percentage distribution derived from the national income accounts and/or by relating consumer expenditure to gross national product.

### *Gross Provincial Capital Formation*

The aggregate value of capital formation in Ontario was obtained directly from the DBS publication, *Private and Public Investment in Canada, 1965*. This provided control totals on new construction as well as on new machinery and equipment. The distribution of investment by industry of origin was estimated on the basis of available data for structurally comparable industries in the United States and other sources.

### *Government Expenditure on Goods and Services*

This category of the final demand sector consists of current expenditures of provincial, federal and municipal governments and school boards on goods and services. Control totals for each category were obtained from the system of provincial income and expenditure accounts, developed by the Economic Analysis Branch and scheduled for publication later this year.

The sectoral allocation of provincial government expenditure was based on information obtained from the DBS Input-Output Section.

Allocation of municipal government expenditure on goods and services was approximated by applying modified ratios secured from the Quebec Bureau of Statistics. These ratios were obtained from a special survey conducted by QBS for the purpose of constructing an input-output table for the province of Quebec.

### *Value of Physical Changes in Inventories*

For the purpose of interindustry analysis the net change of inventories during the year 1965 was taken into account.

The Annual Census of Manufactures provides information on opening and closing inventories at book value for three major categories: raw materials and supplies, finished goods, and goods in process.

Finished goods and goods in process held by each sector were considered to belong to the primary output. For changes in inventories of raw materials and supplies, the allocation was made on the basis of the input distribution for each sector.

## CONCLUSION

Although subject to statistical limitations inherent in the current system of data collection, the present version of the Ontario input-output table reveals in detail the basic structure of the provincial economy in its major ramifications. The Ontario input-output model is of significant value in measuring, quantitatively, the impact of changes in final demand for the product of each sector upon the various levels of economic activity within the province. In addition, by use of supplementary data on employment required per unit of output, target outputs can be translated into sectoral employment requirements.

In order to enhance the usefulness of the model for the analysis of provincial and interprovincial trade-flows, an extensive study is currently being undertaken by the Economic Analysis Branch in cooperation with the Ontario Statistical Centre to estimate the value of provincial imports and exports by sector. The results of this study will be incorporated into the present table to develop an expanded version of the interindustry model, showing imports and exports as separate sectors. Ultimately, the provincial table will be supplemented by a series of consolidated regional input-output tables.

A comprehensive and detailed set of provincial economic accounts in conjunction with an econometric model for Ontario, currently under development in the Economic Analysis Branch and scheduled for publication later this year, will provide an integrated system of quantitative analytical techniques for long and short-term forecasting and the scientific evaluation of alternative economic policies.



**Table I – The Inter-Industry Flow of Goods and Services, Ontario, 1965**  
(Producers' Prices in Thousands of Dollars)

Industry No.	For the distribution of output of an industry, read the row for that industry.  For the composition of inputs to an industry read the column for that industry.	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	
	Industry	1	2	3	4	5
1	Agriculture, Forestry and Fishing	113,606	0	318,845	211,375	100,308
2	Mining	2,217	44,924	709	747	1,916
3	Meat and Poultry	1,377	0	140,766	4,295	14,719
4	Dairy Products	0	0	2,364	91,401	1,377
5	Grain Mills	156,152	4	228	0	17,083
6	Biscuits and Bakeries	0	0	0	38	0
7	Sugar and Confectioneries	347	0	182	8,610	2,862
8	Other Food Industries	4,540	0	18,055	3,232	24,496
9	Soft Drinks	0	0	0	0	0
10	Distilleries, Breweries and Wineries	0	0	0	0	12
11	Tobacco and Tobacco Products	0	0	0	0	0
12	Rubber Products	3,257	0	0	0	0
13	Leather and Leather Products	0	0	0	0	0
14	Cotton Yarn and Cloth	357	0	0	0	0
15	Synthetic Textiles	0	0	0	0	0
16	Knitting Mills	0	0	0	0	0
17	Clothing Industries	232	0	0	0	0
18	Other Textile Mills	9,903	868	289	11	4,740
19	Sawmills	405	10	0	0	0
20	Furniture and Fixtures	0	0	0	0	0
21	Other Wood Industries	3,043	82	1,090	495	0
22	Pulp and Paper Mills	0	0	766	819	915
23	Paper Products	1,477	737	6,236	9,356	1,071
24	Printing and Publishing	0	4	603	1,016	127
25	Iron and Steel Mills	0	1,556	0	0	842
26	Other Primary Metals	0	12,054	9	0	0
27	Fabricated and Structural Metals	0	0	0	0	0
28	Metal Stamping, Pressing and Coating	46	1,299	2,669	2,016	341
29	Other Metal Fabricating Industries	5,276	23,113	0	0	0
30	Miscellaneous Machinery	20,955	652	0	0	0
31	Motor Vehicles and Aircraft	551	0	0	0	0
32	Other Transportation Equipment	308	1,104	0	0	0
33	Electrical Appliances	0	0	0	0	0
34	Electrical Industrial Equipment	0	0	0	0	0
35	Communication Equipment	135	0	0	0	0
36	Other Electrical Products	0	0	0	0	0
37	Clay, Lime and Cement	117	3,116	0	0	0
38	Other Non-metallic Mineral Products	26	0	54	919	0
39	Petroleum Refineries and Coal Products	84,943	10,187	1,098	2,685	887
40	Plastics and Synthetic Resins	12	14	3,735	404	56
41	Paint and Varnish	0	0	0	0	0
42	Pharmaceuticals and Medicines	0	0	0	0	4,531
43	Other Chemical Industries	48,338	38,430	567	397	33
44	Miscellaneous Manufacturing Industries	273	72	68	37	0
45	Construction, Maintenance and Repair	41,015	18,011	1,373	1,477	711
46	Transportation, Storage and Trade	121,991	34,868	25,110	10,213	33,197
47	Utilities	13,763	28,862	2,386	2,767	2,084
48	Communications and Other Services	88,668	45,333	6,021	9,762	4,618
49	Unallocated Sector	85,811	88,833	18,342	24,110	16,275
50	<b>Total Intermediate Input (Rows 1 + . . . + 49)</b>	809,141	354,133	551,565	386,182	239,837
51	Wages and Salaries	166,596	171,437	65,036	65,316	1,061
52	Other Value Added	731,013	304,810	24,516	22,679	27,430
53	<b>Total Value Added (Rows 51 + 52)</b>	897,609	476,247	89,552	87,995	55,491
54	<b>Total Input (Rows 50 + 53)</b>	1,706,750	830,380	641,117	474,177	295,328



	Sugar and Confection- eries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Industry No.
6	7	8	9	10	11	12	13	14	15	
886	3,229	142,634	0	4,013	69,994	0	0	0	15	1
477	2,652	1,522	854	667	43	961	476	136	371	2
3,904	0	41,380	0	0	0	0	26,693	0	0	3
3,136	4,751	8,253	0	0	0	0	0	0	0	4
33,246	89	40,728	0	9,583	0	0	20	0	0	5
0	64	56	0	0	0	0	0	0	0	6
7,988	37,207	11,527	5,565	1,440	6	0	106	0	0	7
30,934	6,954	131,880	7,465	13,287	0	0	256	222	0	8
0	0	0	0	0	0	0	0	0	0	9
0	0	355	191	9,788	0	0	0	0	0	10
0	0	0	0	0	24,968	0	0	0	0	11
0	0	0	0	0	0	53,289	1,878	0	0	12
0	0	0	0	0	0	1,019	34,731	0	0	13
0	0	1	0	0	0	4,612	2,009	17,230	8,802	14
0	0	0	0	0	0	38,334	0	8,549	21,648	15
0	0	0	0	0	0	0	0	0	0	16
0	0	0	0	0	0	0	0	84	0	17
3	115	827	0	0	2	393	3,296	3,688	13,217	18
0	0	1	0	0	0	0	0	0	0	19
0	0	0	0	0	0	0	0	0	0	20
0	0	52	108	292	766	116	220	0	2	21
863	1,896	3,309	0	1,088	776	1,057	878	85	6,762	22
56	5,960	19,404	5,007	10,502	5,910	2,077	1,939	286	1,125	23
4,493	2,073	5,193	731	2,267	769	306	132	44	56	24
0	0	0	0	0	0	0	0	0	0	25
0	0	0	0	0	2,063	0	0	0	0	26
0	0	0	0	0	0	0	0	0	0	27
54	456	45,485	3,540	3,240	7	300	0	0	69	28
0	0	0	0	0	0	4,429	2,663	0	0	29
0	0	0	0	0	0	0	0	0	0	30
0	0	0	0	0	0	0	0	0	0	31
0	0	0	0	0	0	70	0	0	0	32
0	0	0	0	0	0	0	0	0	0	33
0	0	0	0	0	0	0	0	0	0	34
0	0	0	0	0	0	0	0	0	0	35
0	0	0	0	233	0	0	0	0	0	36
0	10	0	0	0	0	998	82	0	0	37
0	100	9,959	534	8,438	0	208	0	0	1,043	38
1,557	298	1,858	669	671	134	1,162	549	99	1,250	39
5,555	37	1,753	0	0	885	42,019	1,821	29	538	40
0	0	0	0	0	0	2,112	0	0	0	41
0	0	214	0	0	0	0	0	0	0	42
64	77	27,176	61	1,629	60	22,130	3,257	1,068	49,095	43
0	7	2,468	265	2,540	37	1,927	5,407	19	58	44
655	498	1,694	315	850	533	970	357	318	854	45
13,956	6,873	41,663	3,828	7,467	6,688	11,129	10,673	1,926	6,235	46
1,169	716	3,215	430	1,794	236	3,215	819	680	1,336	47
8,867	4,254	15,419	2,517	9,757	2,911	11,285	5,434	882	4,661	48
14,299	12,113	55,185	10,852	27,577	9,984	25,032	12,319	2,294	9,313	49
139,972	60,429	613,211	42,932	117,123	126,772	229,150	116,015	37,639	126,450	50
6,052	27,485	89,841	24,193	46,615	14,513	89,596	53,311	14,589	36,910	51
23,661	26,490	93,446	14,084	125,138	31,177	69,336	8,737	6,514	40,537	52
713	53,975	183,287	38,277	171,753	45,690	157,932	62,048	21,103	77,447	53
231,685	144,404	796,498	81,209	288,876	172,462	387,082	178,063	58,742	203,897	54



**Table I — The Inter-Industry Flow of Goods and Services, Ontario, 1965 — Continued**  
(Producers' Prices in Thousands of Dollars)

Industry No.	For the distribution of output of an industry, read the row for that industry.  For the composition of inputs to an industry read the column for that industry.	Knitting Mills	Clothing Industries	Other Textile Mills	Sawmills	
		16	17	18	19	20
Industry						
1 Agriculture, Forestry and Fishing		0	7,267	909	23	26
2 Mining		237	39	519	0	457
3 Meat and Poultry		0	0	0	0	0
4 Dairy Products		0	0	0	0	0
5 Grain Mills		0	0	0	0	0
6 Biscuits and Bakeries		0	0	0	0	0
7 Sugar and Confectioneries		0	0	0	0	0
8 Other Food Industries		0	265	26	0	0
9 Soft Drinks		0	0	0	0	0
10 Distilleries, Breweries and Wineries		0	0	0	0	0
11 Tobacco and Tobacco Products		0	0	0	0	0
12 Rubber Products		64	152	2,448	0	0
13 Leather and Leather Products		502	217	180	0	198
14 Cotton Yarn and Cloth		12,216	32,306	22,725	0	4,864
15 Synthetic Textiles		22,135	18,866	55,915	0	12,807
16 Knitting Mills		4,299	9,459	271	0	0
17 Clothing Industries		0	10,479	72	0	0
18 Other Textile Mills		20,595	29,391	65,449	0	6,577
19 Sawmills		0	0	95	24,367	10,921
20 Furniture and Fixtures		0	0	1,581	0	8,273
21 Other Wood Industries		0	0	1,260	4,250	13,216
22 Pulp and Paper Mills		174	175	1,056	0	649
23 Paper Products		979	1,611	2,032	0	76
24 Printing and Publishing		133	0	230	0	124
25 Iron and Steel Mills		0	0	99	0	16
26 Other Primary Metals		0	0	1,274	0	0
27 Fabricated and Structural Metals		0	44	0	0	15,610
28 Metal Stamping, Pressing and Coating		0	0	60	0	15
29 Other Metal Fabricating Industries		3	37	944	0	17,661
30 Miscellaneous Machinery		0	47	4	0	0
31 Motor Vehicles and Aircraft		0	0	0	0	0
32 Other Transportation Equipment		0	0	0	0	218
33 Electrical Appliances		0	0	0	0	0
34 Electrical Industrial Equipment		0	0	0	0	0
35 Communication Equipment		0	0	35	0	700
36 Other Electrical Products		0	0	5	0	806
37 Clay, Lime and Cement		0	0	12	0	0
38 Other Non-metallic Mineral Products		0	0	121	0	1,233
39 Petroleum Refineries and Coal Products		241	149	893	1,026	396
40 Plastics and Synthetic Resins		387	96	3,712	0	8,257
41 Paint and Varnish		0	0	334	0	2,385
42 Pharmaceuticals and Medicines		0	0	10	0	0
43 Other Chemical Industries		1,048	245	5,637	36	1,187
44 Miscellaneous Manufacturing Industries		300	7,354	3,070	0	609
45 Construction, Maintenance and Repair		272	214	1,286	632	758
46 Transportation, Storage and Trade		3,013	12,812	14,072	7,522	16,798
47 Utilities		582	580	1,840	845	1,373
48 Communications and Other Services		5,285	8,037	6,876	2,102	8,858
49 Unallocated Sector		6,166	9,669	19,186	5,138	12,749
50 <b>Total Intermediate Input (Rows 1 + ... + 49)</b>		78,631	149,511	214,238	45,941	151,629
51 Wages and Salaries		29,301	61,958	63,952	21,528	80,469
52 Other Value Added		13,616	50,664	74,948	16,737	28,765
53 <b>Total Value Added (Rows 51 + 52)</b>		42,917	112,622	138,900	38,265	111,234
54 <b>Total Input (Rows 50 + 53)</b>		121,548	262,133	353,138	84,206	262,863



21	22	23	24	25	26	27	28	29	30	Industry No.
3,857	456	0	0	0	0	0	0	0	0	1
244	12,707	4,197	135	118,022	20,262	180	607	6,484	2,458	2
0	0	0	0	0	0	0	0	0	0	3
0	0	265	0	0	0	0	0	0	0	4
0	8	0	0	0	0	0	0	0	0	5
0	0	227	0	0	0	0	0	0	0	6
0	0	0	0	0	0	0	0	0	0	7
0	3,605	103	0	30	0	0	837	0	0	8
0	0	0	0	0	0	0	0	0	0	9
0	61	570	0	0	0	0	0	0	0	10
0	0	0	0	0	0	0	0	0	0	11
0	0	120	35	0	0	0	100	534	0	12
0	0	0	3	0	0	0	0	0	0	13
0	0	168	0	0	0	0	0	0	0	14
272	0	1,015	0	0	0	0	0	1,274	0	15
0	0	0	0	0	0	0	0	0	0	16
0	0	0	0	0	0	0	0	0	0	17
2	1,379	2,541	407	5	9	0	8	272	149	18
33,142	399	0	0	0	87	171	418	2,831	623	19
652	0	0	0	0	0	0	0	418	0	20
17,605	7,972	4,570	6	291	1,149	20	35	5,766	1,973	21
2,950	152,323	69,810	38,049	508	138	0	621	895	648	22
99	946	92,094	1,448	57	9,995	0	3,217	11,483	9,399	23
0	3,431	4,760	20,123	151	22	0	262	845	58	24
357	0	1,576	0	194,655	35,024	71,609	165,058	260,405	97,842	25
1,147	0	5,940	267	20,102	244,322	1,184	23,531	213,807	43,982	26
0	0	0	200	0	0	0	0	21,386	0	27
78	5	375	20	33	3,198	0	15	11,400	147	28
3,188	0	311	1,692	3,291	29,288	7,138	23,537	126,496	12,525	29
0	0	0	0	0	295	0	8	7,694	6,233	30
47	0	0	0	0	4,645	0	0	33,606	259	31
0	0	0	0	0	591	0	0	19,659	631	32
0	0	0	0	0	662	0	0	8,040	1,627	33
0	0	0	0	0	0	0	616	622	0	34
0	0	0	0	0	428	0	0	2,483	0	35
0	0	0	0	2,336	1,310	0	255	1,841	0	36
11	2,711	2,158	0	16,682	6,795	1	0	765	183	37
2,310	339	1,229	1	0	7	0	4	28	198	38
462	3,387	3,570	520	1,590	11,206	1	611	4,305	2,394	39
653	501	16,500	1,020	0	238	35	87	310	98	40
129	114	0	0	0	269	532	5,582	5,384	3,356	41
0	0	0	0	0	0	0	0	0	0	42
1,952	22,056	9,745	6,648	7,157	5,719	6	151	3,186	32	43
1,416	23	1,580	128	0	3	0	752	1,922	221	44
676	2,585	1,867	3,972	5,565	8,511	637	1,073	6,849	1,641	45
19,077	30,918	24,952	7,842	26,538	37,948	3,580	14,255	65,358	23,700	46
1,391	19,885	2,166	5,835	25,527	17,450	803	2,022	11,080	1,846	47
4,793	10,244	17,480	82,606	15,131	16,003	3,622	13,241	56,084	25,072	48
7,519	30,259	25,227	94,805	89,729	28,788	10,225	14,238	115,507	21,091	49
104,629	306,314	295,116	265,762	527,400	484,362	99,744	271,141	1,009,019	258,386	50
4,838	121,109	98,227	230,588	213,938	177,788	50,493	84,983	424,059	115,048	51
18,424	158,636	44,481	87,747	309,905	82,979	49,542	60,532	208,482	115,432	52
812	279,745	142,708	318,335	523,843	260,767	100,035	145,515	632,541	230,480	53
172,441	586,059	437,824	584,097	1,051,243	745,129	199,779	416,656	1,641,560	488,866	54



**Table 1 — The Inter-Industry Flow of Goods and Services, Ontario, 1965 — Continued**  
(Producers' Prices in Thousands of Dollars)

Industry No.	Industry	Motor Vehicles and Aircraft	Other Transportation Equipment	Electrical Appliances	Electrical Industrial Equipment	Communication Equipment
		31	32	33	34	35
	<i>For the distribution of output of an industry, read the row for that industry.</i>					
	<i>For the composition of inputs to an industry read the column for that industry.</i>					
1	Agriculture, Forestry and Fishing	0	4	0	0	0
2	Mining	10,334	378	1,424	667	846
3	Meat and Poultry	0	0	0	0	0
4	Dairy Products	0	0	0	0	0
5	Grain Mills	0	0	0	0	0
6	Biscuits and Bakeries	0	0	0	0	0
7	Sugar and Confectioneries	0	0	0	0	0
8	Other Food Industries	0	0	0	0	0
9	Soft Drinks	0	0	0	0	0
10	Distilleries, Breweries and Wineries	0	0	0	0	0
11	Tobacco and Tobacco Products	0	0	0	0	0
12	Rubber Products	74,602	0	0	0	2,149
13	Leather and Leather Products	239	500	82	1,418	1,411
14	Cotton Yarn and Cloth	4,058	0	0	0	0
15	Synthetic Textiles	16,720	652	0	0	389
16	Knitting Mills	0	0	0	0	0
17	Clothing Industries	0	0	0	0	0
18	Other Textile Mills	40,575	83	10	6	96
19	Sawmills	4,586	1,461	0	0	0
20	Furniture and Fixtures	224	23	165	0	194
21	Other Wood Industries	1,513	387	875	501	913
22	Pulp and Paper Mills	1,509	0	285	139	1,223
23	Paper Products	10,124	17	12,390	901	1,166
24	Printing and Publishing	212	0	391	30	360
25	Iron and Steel Mills	228,840	23,985	69,280	43,967	20,952
26	Other Primary Metals	170,690	6,076	28,057	51,242	109,111
27	Fabricated and Structural Metals	1,807	9	0	0	0
28	Metal Stamping, Pressing and Coating	12,012	0	41	80	83
29	Other Metal Fabricating Industries	70,575	19,252	5,718	897	1,380
30	Miscellaneous Machinery	14,423	8	0	0	0
31	Motor Vehicles and Aircraft	1,011,110	2,639	83	245	564
32	Other Transportation Equipment	2,068	26,937	0	0	0
33	Electrical Appliances	20,840	0	2,746	293	0
34	Electrical Industrial Equipment	5,358	0	24,213	660	4,317
35	Communication Equipment	22,756	0	1,794	16,125	71,906
36	Other Electrical Products	13,501	265	710	28,470	1,995
37	Clay, Lime and Cement	377	26	3	0	196
38	Other Non-metallic Mineral Products	42,412	0	341	6,281	8,933
39	Petroleum Refineries and Coal Products	4,690	494	1,477	544	1,903
40	Plastics and Synthetic Resins	1,058	140	5,309	1,359	12,055
41	Paint and Varnish	25,295	694	5,398	1,031	2,621
42	Pharmaceuticals and Medicines	0	0	0	0	0
43	Other Chemical Industries	5,848	26	412	298	412
44	Miscellaneous Manufacturing Industries	18,347	2,897	6	0	206
45	Construction, Maintenance and Repair	16,513	913	849	843	1,406
46	Transportation, Storage and Trade	169,550	6,730	13,987	12,682	21,951
47	Utilities	12,084	1,719	2,117	1,758	2,216
48	Communications and Other Services	67,184	3,908	10,987	12,550	25,394
49	Unallocated Sector	161,835	5,197	20,297	19,369	25,627
50	<b>Total Intermediate Input (Rows 1 + ... + 49)</b>	2,263,869	105,420	209,447	202,356	328,465
51	Wages and Salaries	561,105	38,013	69,805	105,847	141,160
52	Other Value Added	661,818	20,369	40,277	56,780	75,796
53	<b>Total Value Added (Rows 51 + 52)</b>	1,222,923	58,382	110,082	162,627	217,956
54	<b>Total Input (Rows 50 + 53)</b>	3,486,792	163,802	319,529	364,983	546,021



Products	Clay, Lime and Cement	Other Non- metallic Mineral Products	Petroleum Refineries and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceu- ticals and Medicines	Other Chemical Industries	Miscel- laneous Manufac- turing Industries	Construc- tion, Maintenance and Repair	Industry No.
36	37	38	39	40	41	42	43	44	45	
0	85	0	0	0	37	241	2,158	928	11,318	1
612	25,429	2,312	327,337	50	729	626	23,025	1,099	29,482	2
0	0	0	0	0	0	0	14,065	72	0	3
0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	163	0	0	5
0	0	0	0	0	0	0	0	0	0	6
0	0	0	0	0	0	495	99	19	0	7
0	284	2	0	1,999	4,661	1,852	30,635	179	0	8
0	0	0	0	82	0	473	1,401	0	0	9
0	0	0	0	0	0	0	198	0	113	10
0	0	0	0	0	0	0	0	0	0	11
0	0	4,617	0	0	842	0	3,870	12,793	10,031	12
7	0	816	97	47	0	0	872	4,375	112	13
0	50	0	0	0	0	0	0	674	121	14
0	0	0	0	0	0	0	336	2,751	1,936	15
0	0	0	0	0	0	0	0	235	0	16
0	0	0	0	0	0	0	59	305	0	17
9	15	363	0	8	0	0	1,085	6,558	18,505	18
0	6	895	0	7	0	0	363	4,639	66,598	19
65	0	60	0	0	0	0	0	798	4,920	20
35	343	265	216	222	1	14	562	7,668	107,173	21
772	2,941	2,455	0	174	28	613	10,822	6,611	9,542	22
11	2,279	6,154	998	685	732	5,656	23,703	9,009	18,261	23
212	23	117	34	12	535	2,239	3,171	2,807	0	24
17,650	3,817	0	9,331	0	0	0	3,559	6,124	48,025	25
2,177	25	516	0	0	0	0	4,388	16,588	99,608	26
0	0	0	0	0	0	0	174	732	76,209	27
121	58	103	7,386	285	4,984	2,887	19,057	14,256	37,744	28
2,683	5,093	80	0	0	0	0	2,945	7,417	245,495	29
0	6	0	0	0	0	0	0	438	8,498	30
672	0	0	0	0	0	0	0	287	3,568	31
0	0	0	0	0	0	0	116	177	0	32
0	0	0	0	0	0	0	0	3,513	3,876	33
0	0	0	0	0	0	0	0	1,958	18,371	34
5,650	0	0	0	477	0	0	8,670	1,812	54,830	35
3,368	0	1,768	0	0	0	0	1,902	4,950	38,033	36
168	39,999	8,599	96	586	157	0	828	421	163,828	37
1,256	3,376	41,128	0	0	180	8,668	6,459	5,057	35,376	38
514	3,864	3,163	44,639	649	711	416	49,670	1,239	39,293	39
7,935	436	596	0	13,283	7,073	332	10,959	56,586	377	40
1,254	0	0	2,477	886	6,765	0	1,650	1,957	16,910	41
0	0	0	0	0	0	3,810	10,381	0	117	42
2,550	858	4,502	22,661	111,128	29,773	7,040	170,628	4,209	9,769	43
6,906	107	183	304	18,494	110	1,077	11,464	44,552	22,191	44
463	2,069	1,411	8,800	681	317	526	7,902	1,939	1,811	45
10,475	30,979	9,856	51,512	2,431	5,826	5,217	58,296	20,043	343,183	46
985	4,576	8,135	2,551	845	389	346	26,399	3,014	2,758	47
7,294	12,485	7,483	5,217	1,568	5,524	9,618	34,440	23,897	146,413	48
17,332	33,436	20,779	6,469	4,192	11,920	27,387	93,173	59,023	23,572	49
125,976	172,639	126,358	490,125	158,791	81,294	79,533	639,647	341,709	1,717,967	50
4,058	71,012	61,154	23,572	8,581	23,078	29,920	155,543	153,089	1,118,079	51
21,275	66,334	33,636	53,759	7,959	15,962	17,767	197,295	47,047	340,672	52
933	137,346	94,790	77,331	16,540	39,040	47,687	352,838	200,136	1,458,751	53
189,909	309,985	221,148	567,456	175,331	120,334	127,220	992,485	541,845	3,176,718	54



**Table I — The Inter-Industry Flow of Goods and Services, Ontario, 1965 — Continued**  
(Producers' Prices in Thousands of Dollars)

Industry No.	Industry	Transporta- tion, Storage and Trade	Utilities	Communi- cations and Other Services	Unallocated Sector	Total Intermediate Demand (C.I.D.)
		46	47	48	49	50
1	Agriculture, Forestry and Fishing	75,308	0	29,182	6,088	1,102,792
2	Mining	2,734	2,857	1,320	34	656,515
3	Meat and Poultry	1,363	0	64,017	11,372	324,023
4	Dairy Products	1,625	0	49,590	7,328	170,090
5	Grain Mills	2,059	0	5,027	715	265,105
6	Biscuits and Bakeries	0	0	29,968	4,254	34,607
7	Sugar and Confectioneries	98	0	5,028	835	82,414
8	Other Food Industries	294	0	39,393	6,912	332,398
9	Soft Drinks	0	0	11,337	3,988	17,281
10	Distilleries, Breweries and Wineries	3,037	0	0	19,010	33,335
11	Tobacco and Tobacco Products	0	0	0	0	24,968
12	Rubber Products	9,799	0	878	42,030	223,488
13	Leather and Leather Products	91	0	823	2,294	50,034
14	Cotton Yarn and Cloth	3,272	0	9,736	402	123,603
15	Synthetic Textiles	4,582	0	598	165	208,944
16	Knitting Mills	0	0	0	0	14,264
17	Clothing Industries	6,114	0	513	2,128	19,986
18	Other Textile Mills	7,186	0	6,390	6,932	251,957
19	Sawmills	2,425	788	349	394	155,981
20	Furniture and Fixtures	126	0	315	0	17,814
21	Other Wood Industries	830	0	5,919	55	191,871
22	Pulp and Paper Mills	6,726	0	4,786	5,193	341,029
23	Paper Products	23,312	0	5,251	23,302	37,156
24	Printing and Publishing	3,914	149	6,289	315,001	384,349
25	Iron and Steel Mills	1,930	0	74	1,067	1,307,640
26	Other Primary Metals	966	0	902	2,655	1,092,000
27	Fabricated and Structural Metals	107	0	0	0	116,278
28	Metal Stamping, Pressing and Coating	4,892	0	0	0	178,857
29	Other Metal Fabricating Industries	7,538	0	2,205	207,366	840,236
30	Miscellaneous Machinery	2,905	813	5,610	5,901	74,490
31	Motor Vehicles and Aircraft	13,409	0	0	52,864	1,124,549
32	Other Transportation Equipment	9,625	0	0	236	61,740
33	Electrical Appliances	0	0	0	1,133	42,730
34	Electrical Industrial Equipment	39	0	0	9,470	65,624
35	Communication Equipment	309	0	377	7,002	195,489
36	Other Electrical Products	1,208	0	11	26,200	129,167
37	Clay, Lime and Cement	193	0	888	188	250,194
38	Other Non-metallic Mineral Products	937	0	1,068	7,513	195,736
39	Petroleum Refineries and Coal Products	86,910	2,649	17,552	2,100	401,275
40	Plastics and Synthetic Resins	1,144	0	237	400	208,031
41	Paint and Varnish	76	0	6,921	27,898	122,030
42	Pharmaceuticals and Medicines	0	0	6,708	5,646	31,417
43	Other Chemical Industries	1,572	130	16,966	48,164	694,133
44	Miscellaneous Manufacturing Industries	5,169	0	11,480	56,564	230,613
45	Construction, Maintenance and Repair	76,749	25,831	398,060	0	653,252
46	Transportation, Storage and Trade	272,076	6,426	91,040	511,495	2,287,957
47	Utilities	30,484	88,461	18,895	0	364,429
48	Communications and Other Services	323,966	21,175	605,626	464,296	2,284,848
49	Unallocated Sector	312,504	13,626	348,082	0	2,106,455
50	<b>Total Intermediate Input (Rows 1 + . . . + 49)</b>	1,309,603	162,905	1,809,411	1,896,590	20,464,479
51	Wages and Salaries	1,743,107	85,714	1,564,222	0	8,780,339
52	Other Value Added	1,095,607	236,081	3,469,677	2,915	9,330,484
53	<b>Total Value Added (Rows 51 + 52)</b>	2,838,714	321,795	5,033,899	2,915	18,113,823
54	<b>Total Input (Rows 50 + 53)</b>	4,148,317	484,700	6,843,310	1,899,505	38,577,602



Consumption Expenditures	Investment	Changes in Inventories, Finished Goods and Goods in Process	Changes in Inventories, Raw Materials	Provincial Government Expenditures	Municipal Government Expenditures	Trade Balance and Other Final Demand	Total Final Demand (Columns 51 + ... + 58)	Total Output (Columns 50 + 58)	Industry No.
51	52	53	54	55	56	57	58	59	
186,697	0	2,392	1,620	3,258	3,385	406,606	603,958	1,706,750	1
0	0	9,580	5,649	6,031	15,124	137,481	173,865	830,380	2
408,851	0	— 1,156	287	2,192	385	—93,465	317,094	641,117	3
134,836	0	729	185	2,109	323	165,905	304,087	474,177	4
117,990	0	— 107	391	304	27	—88,382	30,223	295,328	5
134,085	0	—28	1	1,001	296	61,723	197,078	231,685	6
103,217	0	796	461	330	119	—42,933	61,990	144,404	7
361,060	0	6,982	1,161	1,537	1,383	91,977	464,100	796,498	8
66,246	0	481	10	317	317	— 3,443	63,928	81,209	9
121,848	0	1,385	28	10	63	132,207	255,541	288,876	10
46,085	0	—365	—48	100	162	101,560	147,494	172,462	11
21,132	323	—388	487	626	1,656	139,758	163,594	387,082	12
89,692	0	— 1,038	660	93	263	38,359	128,029	178,063	13
22,076	0	159	1,396	143	44	—88,679	—64,861	58,742	14
53,636	0	1,794	1,730	1	48	—62,256	— 5,047	203,897	15
60,327	0	282	120	23	31	46,501	107,284	121,548	16
447,859	0	495	85	310	3,914	—210,516	242,147	262,133	17
75,056	2,511	1,150	1,961	1,009	832	18,662	101,181	353,138	18
1,467	106	356	1,435	0	12,821	—87,960	—71,775	84,206	19
135,997	34,106	672	300	809	33	73,132	245,049	262,863	20
3,222	148	1,721	1,177	1,202	1,742	—28,642	—19,430	172,441	21
36,453	0	—176	649	76	31	207,997	245,030	586,059	22
22,006	0	1,989	1,694	593	2,594	30,882	59,758	437,824	23
38,803	0	2,070	214	2,024	8,145	148,792	200,048	584,097	24
0	0	30,039	48,612	229	2,301	—337,578	—256,397	1,051,243	25
6,507	0	729	16,945	474	26,658	—398,879	—347,566	745,129	26
0	0	3,324	944	10,343	41,300	27,590	83,501	199,779	27
5,353	1,475	1,885	1,073	3,332	937	223,744	237,799	416,656	28
87,220	291,074	28,797	5,277	12,476	44,067	332,413	801,324	1,641,560	29
13,614	106,617	5,455	792	495	0	287,403	414,376	488,866	30
1,055,224	209,354	23,121	10,344	1,346	5,409	1,057,445	2,362,243	3,486,792	31
44,498	42,877	1,123	884	0	416	12,264	102,062	163,802	32
81,212	3,181	2,741	0	38	40	189,587	276,799	319,529	33
7,244	51,572	975	—25	497	0	239,096	299,359	364,983	34
54,908	48,724	6,505	1,262	852	4,023	234,258	350,532	546,021	35
11,147	21,724	1,947	214	376	139	25,195	60,742	189,909	36
9,681	0	1,511	870	3,618	40,356	3,755	59,791	309,985	37
23,221	0	796	745	204	1,474	— 1,028	25,412	221,148	38
223,688	0	799	1,195	6,003	20,110	—85,614	166,181	567,456	39
1,561	0	179	1,210	1	47	—35,698	—32,700	175,331	40
12,036	0	802	626	798	1,157	—17,115	— 1,696	120,334	41
90,932	0	7	40	1,512	437	2,875	95,803	127,220	42
70,834	0	4,497	2,279	2,695	6,438	211,609	298,352	992,485	43
133,266	40,373	6,097	2,617	1,677	3,886	123,316	311,232	541,845	44
88,430	1,686,209	0	1,733	65,655	51,215	630,224	2,523,466	3,176,718	45
2,995,356	556,071	43,094	24,111	105,517	137,042	—2,000,831	1,860,360	4,148,317	46
316,880	0	—16	2,231	1,806	55,714	—256,344	120,271	484,700	47
4,497,444	71,635	0	10,821	43,493	326,099	—391,030	4,558,462	6,843,310	48
0	0	0	21,255	1,470	0	—229,675	—206,950	1,899,505	49
0	0	0	0	0	0	0	0	0	50
0	0	0	0	307,300	961,995	0	1,269,295	10,051,934	51
0	0	0	0	0	0	0	0	9,330,484	52
0	0	0	0	307,300	961,995	0	1,269,295	19,382,418	53
12,518,897	3,168,080	194,182	177,708	596,305	1,784,998	942,248	19,382,418	0	54



**Table II – Direct Requirements Table, Ontario, 1965**  
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	
	Industry	1	2	3	4	5	6
1	Agriculture, Forestry and Fishing	.066563	.0	.497327	.445772	.339649	.003824
2	Mining	.001299	.054101	.001106	.001575	.006488	.002059
3	Meat and Poultry	.000807	.0	.219564	.009058	.049840	.016850
4	Dairy Products	.0	.0	.003687	.192757	.004663	.013536
5	Grain Mills	.091491	.000005	.000356	.0	.057844	.143497
6	Biscuits and Bakeries	.0	.0	.0	.000080	.0	.0
7	Sugar and Confectioneries	.000203	.0	.000284	.018158	.009691	.034478
8	Other Food Industries	.002660	.0	.028162	.006816	.082945	.133517
9	Soft Drinks	.0	.0	.0	.0	.0	.0
10	Distilleries, Breweries and Wineries	.0	.0	.0	.0	.000041	.0
11	Tobacco and Tobacco Products	.0	.0	.0	.0	.0	.0
12	Rubber Products	.001908	.0	.0	.0	.0	.0
13	Leather and Leather Products	.0	.0	.0	.0	.0	.0
14	Cotton Yarn and Cloth	.000209	.0	.0	.0	.0	.0
15	Synthetic Textiles	.0	.0	.0	.0	.0	.0
16	Knitting Mills	.0	.0	.0	.0	.0	.0
17	Clothing Industries	.000136	.0	.0	.0	.0	.0
18	Other Textile Mills	.005802	.001045	.000451	.000023	.016050	.000013
19	Sawmills	.000237	.000012	.0	.0	.0	.0
20	Furniture and Fixtures	.0	.0	.0	.0	.0	.0
21	Other Wood Industries	.001783	.000099	.001700	.001044	.0	.0
22	Pulp and Paper Mills	.0	.0	.001195	.001727	.003098	.003725
23	Paper Products	.000865	.000888	.009727	.019731	.024065	.030011
24	Printing and Publishing	.0	.000005	.000941	.002143	.002462	.019393
25	Iron and Steel Mills	.0	.001874	.0	.0	.002851	.0
26	Other Primary Metals	.0	.014516	.000014	.0	.0	.0
27	Fabricated and Structural Metals	.0	.0	.0	.0	.0	.0
28	Metal Stamping, Pressing and Coating	.000027	.001564	.004163	.004252	.001155	.000233
29	Other Metal Fabricating Industries	.003091	.027834	.0	.0	.0	.0
30	Miscellaneous Machinery	.012278	.000785	.0	.0	.0	.0
31	Motor Vehicles and Aircraft	.000323	.0	.0	.0	.0	.0
32	Other Transportation Equipment	.000180	.001330	.0	.0	.0	.0
33	Electrical Appliances	.0	.0	.0	.0	.0	.0
34	Electrical Industrial Equipment	.0	.0	.0	.0	.0	.0
35	Communication Equipment	.000079	.0	.0	.0	.0	.0
36	Other Electrical Products	.0	.0	.0	.0	.0	.0
37	Clay, Lime and Cement	.000069	.003752	.0	.0	.0	.0
38	Other Non-metallic Mineral Products	.000015	.0	.000084	.001938	.0	.0
39	Petroleum Refineries and Coal Products	.049769	.012268	.001713	.005662	.003003	.006720
40	Plastics and Synthetic Resins	.000007	.000017	.005826	.000852	.000190	.023977
41	Paint and Varnish	.0	.0	.0	.0	.0	.0
42	Pharmaceuticals and Medicines	.0	.0	.0	.0	.015342	.0
43	Other Chemical Industries	.028322	.046280	.000884	.000837	.000112	.000276
44	Miscellaneous Manufacturing Industries	.000160	.000087	.000106	.000078	.0	.0
45	Construction, Maintenance and Repair	.024031	.021690	.002142	.003115	.002407	.002827
46	Transportation, Storage and Trade	.071476	.041990	.039166	.021538	.112407	.060237
47	Utilities	.008064	.034758	.003722	.005835	.007057	.005046
48	Communications and Other Services	.051951	.054593	.009391	.020587	.015637	.038272
49	Unallocated Sector	.050277	.106979	.028609	.050846	.055108	.061717
50	Wages and Salaries	.097611	.206456	.101442	.137746	.095016	.293726
51	Other Value Added	.428307	.367073	.038240	.047829	.092880	.100000
52	<b>Total</b>	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Note: Figures may not add to total due to rounding.







**Table II — Direct Requirements Table, Ontario, 1965 — Continued**  
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper Mills
		17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	.027723	.002574	.000273	.000099	.022367	.000778
2	Mining	.000149	.001470	.0	.001739	.001415	.021682
3	Meat and Poultry	.0	.0	.0	.0	.0	.0
4	Dairy Products	.0	.0	.0	.0	.0	.0
5	Grain Mills	.0	.0	.0	.0	.0	.000014
6	Biscuits and Bakeries	.0	.0	.0	.0	.0	.0
7	Sugar and Confectioneries	.0	.0	.0	.0	.0	.0
8	Other Food Industries	.001011	.000074	.0	.0	.0	.006151
9	Soft Drinks	.0	.0	.0	.0	.0	.0
10	Distilleries, Breweries and Wineries	.0	.0	.0	.0	.0	.000104
11	Tobacco and Tobacco Products	.0	.0	.0	.0	.0	.0
12	Rubber Products	.000580	.006932	.0	.0	.0	.0
13	Leather and Leather Products	.000828	.000510	.0	.000753	.0	.0
14	Cotton Yarn and Cloth	.123243	.064352	.0	.018504	.0	.0
15	Synthetic Textiles	.071971	.158338	.0	.048721	.001577	.0
16	Knitting Mills	.036085	.000767	.0	.0	.0	.0
17	Clothing Industries	.039976	.000204	.0	.0	.0	.0
18	Other Textile Mills	.112122	.185335	.0	.025021	.000012	.002353
19	Sawmills	.0	.000269	.289374	.041546	.192193	.000681
20	Furniture and Fixtures	.0	.004477	.0	.031473	.003781	.0
21	Other Wood Industries	.0	.003568	.050471	.050277	.102093	.013603
22	Pulp and Paper Mills	.000668	.002990	.0	.002469	.017107	.259911
23	Paper Products	.006146	.005754	.0	.014745	.004054	.000014
24	Printing and Publishing	.0	.000651	.0	.000472	.0	.005854
25	Iron and Steel Mills	.0	.000280	.0	.000061	.002070	.0
26	Other Primary Metals	.0	.003608	.0	.000046	.006652	.0
27	Fabricated and Structural Metals	.000168	.0	.0	.059385	.0	.0
28	Metal Stamping, Pressing and Coating	.0	.000170	.0	.000057	.000452	.000009
29	Other Metal Fabricating Industries	.000141	.002673	.0	.067187	.018487	.0
30	Miscellaneous Machinery	.000179	.000011	.0	.0	.0	.0
31	Motor Vehicles and Aircraft	.0	.0	.0	.0	.000273	.0
32	Other Transportation Equipment	.0	.0	.0	.000829	.0	.0
33	Electrical Appliances	.0	.0	.0	.0	.0	.0
34	Electrical Industrial Equipment	.0	.0	.0	.0	.0	.0
35	Communication Equipment	.0	.000099	.0	.002663	.0	.0
36	Other Electrical Products	.0	.000014	.0	.003066	.0	.0
37	Clay, Lime and Cement	.0	.000034	.0	.0	.000064	.004626
38	Other Non-metallic Mineral Products	.0	.000343	.0	.004691	.013396	.000578
39	Petroleum Refineries and Coal Products	.000568	.002529	.012184	.001506	.002679	.005779
40	Plastics and Synthetic Resins	.000366	.010511	.0	.031412	.003787	.000855
41	Paint and Varnish	.0	.000946	.0	.009073	.000748	.000195
42	Pharmaceuticals and Medicines	.0	.000028	.0	.0	.0	.0
43	Other Chemical Industries	.000935	.015963	.000428	.004516	.011320	.037634
44	Miscellaneous Manufacturing Industries	.028054	.008693	.0	.002317	.008212	.000039
45	Construction, Maintenance and Repair	.000816	.003642	.007505	.002884	.003920	.004411
46	Transportation, Storage and Trade	.048876	.039848	.089329	.063904	.110629	.052756
47	Utilities	.002213	.005210	.010035	.005223	.008067	.033930
48	Communications and Other Services	.030660	.019471	.024963	.033698	.027795	.017479
49	Unallocated Sector	.036886	.054330	.061017	.048501	.043603	.051631
50	Wages and Salaries	.236361	.181097	.255659	.313734	.286405	.206650
51	Other Value Added	.193276	.212235	.198763	.109430	.106843	.270000
52	<b>Total</b>	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Note: Figures may not add to total due to rounding.







**Table II — Direct Requirements Table, Ontario, 1965 — Continued**  
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Electrical Appliances	Electrical Industrial Equipment	Communi- cation Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non- metallic Products
Industry		33	34	35	36	37	38
1	Agriculture, Forestry and Fishing	.0	.0	.0	.0	.000274	.0
2	Mining	.004457	.001827	.001549	.003223	.082033	.010455
3	Meat and Poultry	.0	.0	.0	.0	.0	.0
4	Dairy Products	.0	.0	.0	.0	.0	.0
5	Grain Mills	.0	.0	.0	.0	.0	.0
6	Biscuits and Bakeries	.0	.0	.0	.0	.0	.0
7	Sugar and Confectioneries	.0	.0	.0	.0	.0	.0
8	Other Food Industries	.0	.0	.0	.0	.000916	.000009
9	Soft Drinks	.0	.0	.0	.0	.0	.0
10	Distilleries, Breweries and Wineries	.0	.0	.0	.0	.0	.0
11	Tobacco and Tobacco Products	.0	.0	.0	.0	.0	.0
12	Rubber Products	.0	.0	.003936	.0	.0	.020877
13	Leather and Leather Products	.000257	.003885	.002584	.000037	.0	.003690
14	Cotton Yarn and Cloth	.0	.0	.0	.0	.000161	.0
15	Synthetic Textiles	.0	.0	.000712	.0	.0	.0
16	Knitting Mills	.0	.0	.0	.0	.0	.0
17	Clothing Industries	.0	.0	.0	.0	.0	.0
18	Other Textile Mills	.000031	.000016	.000176	.000047	.000048	.001641
19	Sawmills	.0	.0	.0	.0	.000019	.004047
20	Furniture and Fixtures	.000516	.0	.000355	.000342	.0	.000271
21	Other Wood Industries	.002738	.001373	.001672	.000184	.001107	.001198
22	Pulp and Paper Mills	.000892	.000381	.002240	.004065	.009488	.011101
23	Paper Products	.038776	.002469	.014021	.025333	.007352	.020008
24	Printing and Publishing	.001224	.000082	.000659	.001116	.000074	.000529
25	Iron and Steel Mills	.216819	.120463	.038372	.092939	.012313	.0
26	Other Primary Metals	.087807	.140396	.199829	.169434	.000081	.002300
27	Fabricated and Structural Metals	.0	.0	.0	.0	.0	.0
28	Metal Stamping, Pressing and Coating	.000128	.000219	.000152	.000637	.000187	.000466
29	Other Metal Fabricating Industries	.017895	.002458	.002527	.014128	.016430	.000362
30	Miscellaneous Machinery	.0	.0	.0	.0	.000019	.0
31	Motor Vehicles and Aircraft	.000260	.000671	.001033	.003539	.0	.0
32	Other Transportation Equipment	.0	.0	.0	.0	.0	.0
33	Electrical Appliances	.008594	.000803	.0	.0	.0	.0
34	Electrical Industrial Equipment	.075777	.001808	.007906	.0	.0	.0
35	Communication Equipment	.005615	.044180	.131691	.029751	.0	.0
36	Other Electrical Products	.002222	.078004	.003654	.017735	.0	.007995
37	Clay, Lime and Cement	.000009	.0	.000359	.000885	.129035	.038883
38	Other Non-metallic Mineral Products	.001067	.017209	.016360	.006614	.010891	.185975
39	Petroleum Refineries and Coal Products	.004622	.001490	.003485	.002707	.012465	.014303
40	Plastics and Synthetic Resins	.016615	.003723	.022078	.041783	.001407	.002695
41	Paint and Varnish	.016894	.002825	.004800	.006603	.0	.0
42	Pharmaceuticals and Medicines	.0	.0	.0	.0	.0	.0
43	Other Chemical Industries	.001289	.000816	.000755	.013427	.002768	.020357
44	Miscellaneous Manufacturing Industries	.000019	.0	.000377	.036365	.000345	.000828
45	Construction, Maintenance and Repair	.002657	.002310	.002575	.002438	.006675	.006380
46	Transportation, Storage and Trade	.043774	.034747	.040202	.055158	.099937	.044567
47	Utilities	.006625	.004817	.004058	.005187	.014762	.036785
48	Communications and Other Services	.034385	.034385	.046507	.038408	.040276	.033837
49	Unallocated Sector	.063522	.053068	.046934	.091265	.107863	.093960
50	Wages and Salaries	.218463	.290006	.259624	.224623	.229083	.276530
51	Other Value Added	.126051	.155569	.138815	.112028	.213991	.150000
52	<b>Total</b>	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Note: Figures may not add to total due to rounding.







**Table III – Total Requirements Table, Ontario, 1965**  
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Biscuits and Bakeries
	Industry	1	2	3	4	5	6
1	Agriculture, Forestry and Fishing	1.12849	0.00941	0.73819	0.64061	0.48653	0.14969
2	Mining	0.05127	1.08057	0.04144	0.04171	0.04163	0.02795
3	Meat and Poultry	0.01317	0.00494	1.29463	0.02476	0.08392	0.04994
4	Dairy Products	0.00284	0.00222	0.00915	1.24305	0.01131	0.02477
5	Grain Mills	0.11105	0.00168	0.07578	0.06412	1.11580	0.17761
6	Biscuits and Bakeries	0.00082	0.00097	0.00088	0.00110	0.00101	1.00103
7	Sugar and Confectioneries	0.00253	0.00056	0.00338	0.03230	0.01784	0.05348
8	Other Food Industries	0.01934	0.00552	0.05813	0.02544	0.12101	0.18810
9	Soft Drinks	0.00054	0.00068	0.00058	0.00063	0.00071	0.00066
10	Distilleries, Breweries and Wineries	0.00131	0.00180	0.00159	0.00179	0.00205	0.00194
11	Tobacco and Tobacco Products	0.0	0.0	0.0	0.0	0.0	0.0
12	Rubber Products	0.00677	0.00562	0.00658	0.00685	0.00720	0.00594
13	Leather and Leather Products	0.00039	0.00050	0.00044	0.00047	0.00051	0.00052
14	Cotton Yarn and Cloth	0.00245	0.00114	0.00213	0.00197	0.00420	0.00175
15	Synthetic Textiles	0.00387	0.00194	0.00344	0.00318	0.00739	0.00298
16	Knitting Mills	0.00003	0.00002	0.00003	0.00003	0.00005	0.00003
17	Clothing Industries	0.00056	0.00040	0.00057	0.00054	0.00069	0.00051
18	Other Textile Mills	0.01264	0.00374	0.01013	0.00866	0.02923	0.00780
19	Sawmills	0.00347	0.00259	0.00369	0.00337	0.00295	0.00225
20	Furniture and Fixtures	0.00018	0.00013	0.00017	0.00016	0.00024	0.00013
21	Other Wood Industries	0.00496	0.00275	0.00669	0.00572	0.00421	0.00333
22	Pulp and Paper Mills	0.00778	0.00765	0.01403	0.01877	0.02280	0.02948
23	Paper Products	0.01277	0.01015	0.02888	0.04405	0.05006	0.01115
24	Printing and Publishing	0.02030	0.02864	0.02568	0.03111	0.03350	0.05084
25	Iron and Steel Mills	0.01702	0.02458	0.01910	0.01827	0.02261	0.01795
26	Other Primary Metals	0.01428	0.04243	0.01458	0.01495	0.01542	0.01302
27	Fabricated and Structural Metals	0.00139	0.00176	0.00126	0.00126	0.00121	0.00094
28	Metal Stamping, Pressing and Coating	0.00483	0.00551	0.01209	0.01007	0.01211	0.01458
29	Other Metal Fabricating Industries	0.02478	0.05906	0.02565	0.02754	0.02818	0.02474
30	Miscellaneous Machinery	0.01495	0.00223	0.01017	0.00903	0.00721	0.00288
31	Motor Vehicles and Aircraft	0.00655	0.00912	0.00736	0.00806	0.00878	0.00787
32	Other Transportation Equipment	0.00120	0.00300	0.00118	0.00112	0.00136	0.00100
33	Electrical Appliances	0.00039	0.00059	0.00040	0.00042	0.00043	0.00039
34	Electrical Industrial Equipment	0.00090	0.00117	0.00099	0.00109	0.00112	0.00104
35	Communication Equipment	0.00229	0.00266	0.00225	0.00223	0.00223	0.00212
36	Other Electrical Products	0.00252	0.00337	0.00279	0.00308	0.00322	0.00299
37	Clay, Lime and Cement	0.00371	0.00831	0.00350	0.00363	0.00359	0.00306
38	Other Non-metallic Mineral Products	0.00275	0.00282	0.00357	0.00596	0.00598	0.00572
39	Petroleum Refineries and Coal Products	0.07102	0.02467	0.05283	0.05189	0.04221	0.02697
40	Plastics and Synthetic Resins	0.00363	0.00370	0.01265	0.00626	0.00669	0.03299
41	Paint and Varnish	0.00300	0.00368	0.00334	0.00360	0.00373	0.00360
42	Pharmaceuticals and Medicines	0.00285	0.00147	0.00233	0.00212	0.01882	0.00406
43	Other Chemical Industries	0.05707	0.07486	0.05358	0.04528	0.04630	0.05415
44	Miscellaneous Manufacturing Industries	0.00636	0.00800	0.00832	0.00803	0.00905	0.01160
45	Construction, Maintenance and Repair	0.04271	0.03935	0.03639	0.03560	0.03265	0.02332
46	Transportation, Storage and Trade	0.16187	0.12212	0.18883	0.16148	0.25858	0.18350
47	Utilities	0.02120	0.05421	0.02335	0.02526	0.02615	0.02051
48	Communications and Other Services	0.12844	0.13839	0.12865	0.14244	0.13924	0.14019
49	Unallocated Sector	0.11052	0.16132	0.13199	0.15289	0.16122	0.15409
50	<b>Total</b>	2.11372	1.97200	3.07334	2.94193	2.90289	2.60106

Note: Figures may not add to total due to rounding.



Correction Series	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Knitting Mills	Industry No.
7	8	9	10	11	12	13	14	15	16	
0.09282	0.33579	0.04561	0.05588	0.54080	0.01447	0.14737	0.01155	0.01632	0.01173	1
0.04364	0.03733	0.03529	0.01720	0.03226	0.03048	0.02580	0.02131	0.03853	0.02110	2
0.01119	0.09309	0.01310	0.01074	0.00843	0.00943	0.24559	0.00564	0.01073	0.00687	3
0.05856	0.02001	0.00801	0.00341	0.00256	0.00224	0.00366	0.00176	0.00212	0.00209	4
0.01510	0.09947	0.01175	0.04588	0.05361	0.00269	0.01604	0.00223	0.00300	0.00204	5
0.00167	0.00115	0.00118	0.00088	0.00092	0.00091	0.00098	0.00070	0.00083	0.00089	6
1.35081	0.02613	0.09549	0.00927	0.00154	0.00081	0.00217	0.00064	0.00086	0.00061	7
0.08470	1.22050	0.12190	0.06616	0.01154	0.01483	0.01832	0.01369	0.01741	0.00850	8
0.00066	0.00075	1.00073	0.00056	0.00060	0.00097	0.00069	0.00060	0.00102	0.00069	9
0.00217	0.00267	0.00493	1.03687	0.00176	0.00181	0.00190	0.00141	0.00169	0.00156	10
0.0	0.0	0.0	0.0	1.16928	0.0	0.0	0.0	0.0	0.0	11
0.00627	0.00774	0.00730	0.00634	0.00643	1.16684	0.02275	0.00579	0.00750	0.00799	12
0.00049	0.00070	0.00063	0.00069	0.00045	0.00480	1.24334	0.00058	0.00095	0.00606	13
0.00148	0.00204	0.00139	0.00117	0.00182	0.03042	0.02515	1.44420	0.08023	0.18927	14
0.00256	0.00353	0.00250	0.00215	0.00300	0.13807	0.01381	0.26027	1.15116	0.28881	15
0.00003	0.00004	0.00003	0.00003	0.00003	0.00005	0.00007	0.00021	0.00011	1.03690	16
0.00050	0.00059	0.00052	0.00038	0.00053	0.00047	0.00058	0.00253	0.00055	0.00071	17
0.00544	0.00920	0.00411	0.00397	0.00772	0.01770	0.03576	0.13434	0.10062	0.25560	18
0.00223	0.00295	0.00268	0.00233	0.00436	0.00251	0.00343	0.00199	0.00255	0.00223	19
0.00011	0.00016	0.00012	0.00012	0.00016	0.00020	0.00033	0.00070	0.00056	0.00127	20
0.00353	0.00407	0.00484	0.00381	0.01005	0.00338	0.00576	0.00267	0.00364	0.00334	21
0.04956	0.02738	0.03046	0.02485	0.02609	0.02462	0.02292	0.02488	0.06768	0.02757	22
0.0270	0.05518	0.09645	0.05953	0.06115	0.02470	0.03170	0.02078	0.02722	0.02508	23
0.05382	0.04149	0.04987	0.03696	0.03252	0.02981	0.03094	0.02334	0.02713	0.02626	24
0.01637	0.05051	0.03861	0.01783	0.01545	0.01897	0.01903	0.01041	0.01635	0.01112	25
0.01442	0.02290	0.02041	0.01309	0.03469	0.01822	0.01911	0.01095	0.01578	0.01246	26
0.00096	0.00119	0.00100	0.00076	0.00115	0.00112	0.00127	0.00087	0.00098	0.00089	27
0.01163	0.07433	0.05352	0.01767	0.00374	0.00956	0.00655	0.00473	0.01042	0.00462	28
0.02792	0.03356	0.03396	0.02347	0.02649	0.03952	0.04657	0.01947	0.02384	0.02174	29
0.00227	0.00537	0.00180	0.00160	0.00774	0.00125	0.00301	0.00096	0.00114	0.00103	30
0.00891	0.00935	0.01027	0.00743	0.00799	0.00811	0.00893	0.00604	0.00703	0.00668	31
0.00100	0.00124	0.00106	0.00074	0.00110	0.00132	0.00133	0.00072	0.00088	0.00075	32
0.00041	0.00050	0.00050	0.00041	0.00042	0.00060	0.00078	0.00031	0.00038	0.00036	33
0.00116	0.00131	0.00139	0.00102	0.00103	0.00114	0.00126	0.00083	0.00099	0.00092	34
0.00192	0.00270	0.00211	0.00170	0.00213	0.00452	0.00257	0.00254	0.00513	0.00263	35
0.00330	0.00380	0.00393	0.00402	0.00296	0.00359	0.00356	0.00255	0.00345	0.00279	36
0.00321	0.00474	0.00380	0.00396	0.00350	0.00680	0.00350	0.00239	0.00356	0.00238	37
0.00507	0.02208	0.01293	0.04043	0.00279	0.00624	0.00354	0.00454	0.01265	0.00485	38
0.01748	0.03495	0.02112	0.01321	0.04001	0.02553	0.02396	0.01727	0.03503	0.01776	39
0.00706	0.01041	0.00813	0.00662	0.01215	0.14680	0.02736	0.00781	0.01331	0.01328	40
0.00377	0.00494	0.00490	0.00334	0.00337	0.01134	0.00400	0.00291	0.00389	0.00337	41
0.00129	0.00355	0.00136	0.00166	0.00191	0.00335	0.00170	0.00188	0.00454	0.00195	42
0.03088	0.08817	0.03267	0.03074	0.04445	0.25037	0.07431	0.12706	0.36566	0.12626	43
0.00892	0.01402	0.01385	0.01753	0.00865	0.03292	0.05232	0.00932	0.01324	0.01413	44
0.02257	0.02852	0.02101	0.01669	0.03153	0.02026	0.02239	0.02194	0.02260	0.01964	45
0.16223	0.19756	0.15769	0.10934	0.16819	0.12828	0.18107	0.12476	0.13396	0.11995	46
0.02020	0.02442	0.01891	0.01788	0.01725	0.02978	0.02059	0.03309	0.03231	0.02283	47
0.13862	0.14132	0.13868	0.11401	0.12789	0.12421	0.13560	0.09485	0.11413	0.13120	48
0.18143	0.17892	0.21130	0.15396	0.14789	0.15570	0.16307	0.12081	0.14023	0.13557	49
2.56302	2.95230	2.35378	2.00830	2.69206	2.57166	2.72645	2.61078	2.54385	2.60634	50



**Table III — Total Requirements Table, Ontario, 1965 — Continued**  
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper Mills
	Industry	17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	0.04207	0.01413	0.01084	0.01151	0.03806	0.01251
2	Mining	0.01495	0.02149	0.01937	0.02331	0.01969	0.04813
3	Meat and Poultry	0.00489	0.00576	0.00295	0.00470	0.00376	0.00469
4	Dairy Products	0.00175	0.00185	0.00173	0.00189	0.00182	0.00169
5	Grain Mills	0.00488	0.00223	0.00160	0.00188	0.00435	0.00240
6	Biscuits and Bakeries	0.00073	0.00077	0.00075	0.00080	0.00076	0.00066
7	Sugar and Confectioneries	0.00056	0.00057	0.00040	0.00052	0.00049	0.00064
8	Other Food Industries	0.00785	0.00842	0.00263	0.00645	0.00423	0.01499
9	Soft Drinks	0.00053	0.00066	0.00046	0.00059	0.00049	0.00051
10	Distilleries, Breweries and Wineries	0.00129	0.00158	0.00148	0.00148	0.00143	0.00148
11	Tobacco and Tobacco Products	0.0	0.0	0.0	0.0	0.0	0.0
12	Rubber Products	0.00731	0.01568	0.00446	0.00552	0.00525	0.00431
13	Leather and Leather Products	0.00213	0.00150	0.00034	0.00155	0.00055	0.00040
14	Cotton Yarn and Cloth	0.21457	0.13107	0.00096	0.03597	0.00141	0.00122
15	Synthetic Textiles	0.16077	0.24741	0.00162	0.07102	0.00419	0.00216
16	Knitting Mills	0.03916	0.00104	0.00002	0.00006	0.00003	0.00002
17	Clothing Industries	1.04237	0.00086	0.00047	0.00047	0.00051	0.00036
18	Other Textile Mills	0.18347	1.26007	0.00202	0.04239	0.00305	0.00594
19	Sawmills	0.00228	0.00421	1.43056	0.07944	0.30833	0.00851
20	Furniture and Fixtures	0.00097	0.00594	0.00040	1.03304	0.00453	0.00017
21	Other Wood Industries	0.00311	0.00780	0.08195	0.06491	1.13363	0.02245
22	Pulp and Paper Mills	0.01856	0.02726	0.00685	0.01982	0.03379	1.35914
23	Paper Products	0.02018	0.02187	0.00599	0.03001	0.01387	0.00005
24	Printing and Publishing	0.02052	0.02582	0.02242	0.02343	0.02149	0.02896
25	Iron and Steel Mills	0.01008	0.01332	0.00914	0.05603	0.01837	0.00961
26	Other Primary Metals	0.01148	0.01925	0.00966	0.03088	0.02574	0.00900
27	Fabricated and Structural Metals	0.00094	0.00122	0.00090	0.06315	0.00140	0.00079
28	Metal Stamping, Pressing and Coating	0.00408	0.00520	0.00194	0.00462	0.00342	0.00370
29	Other Metal Fabricating Industries	0.01830	0.02566	0.02100	0.09983	0.04259	0.01933
30	Miscellaneous Machinery	0.00148	0.00109	0.00102	0.00139	0.00147	0.00102
31	Motor Vehicles and Aircraft	0.00565	0.00695	0.00668	0.00895	0.00767	0.00587
32	Other Transportation Equipment	0.00072	0.00086	0.00092	0.00301	0.00133	0.00078
33	Electrical Appliances	0.00049	0.00044	0.00030	0.00078	0.00049	0.00028
34	Electrical Industrial Equipment	0.00087	0.00096	0.00085	0.00095	0.00087	0.00078
35	Communication Equipment	0.00201	0.00287	0.00144	0.00558	0.00173	0.00194
36	Other Electrical Products	0.00251	0.00294	0.00241	0.00607	0.00266	0.00231
37	Clay, Lime and Cement	0.00194	0.00259	0.00209	0.00369	0.00344	0.00930
38	Other Non-metallic Mineral Products	0.00360	0.00524	0.00295	0.00999	0.02068	0.00367
39	Petroleum Refineries and Coal Products	0.01404	0.01871	0.02676	0.01505	0.01921	0.01910
40	Plastics and Synthetic Resins	0.01104	0.02290	0.00257	0.04215	0.00908	0.00461
41	Paint and Varnish	0.00280	0.00457	0.00271	0.01351	0.00367	0.00283
42	Pharmaceuticals and Medicines	0.00135	0.00200	0.00067	0.00136	0.00094	0.00132
43	Other Chemical Industries	0.07610	0.12992	0.01398	0.07620	0.03659	0.07739
44	Miscellaneous Manufacturing Industries	0.04061	0.02191	0.00631	0.01486	0.01666	0.00645
45	Construction, Maintenance and Repair	0.01612	0.01950	0.02395	0.01906	0.02202	0.02036
46	Transportation, Storage and Trade	0.13146	0.13414	0.19819	0.15732	0.22247	0.13513
47	Utilities	0.01658	0.02275	0.02387	0.02132	0.02483	0.06500
48	Communications and Other Services	0.10683	0.10410	0.10447	0.11592	0.11195	0.08917
49	Unallocated Sector	0.11012	0.13612	0.12697	0.12522	0.11884	0.11557
50	<b>Total</b>	2.38605	2.51322	2.19199	2.35764	2.32387	2.13790

Note: Figures may not add to total due to rounding.



Products	Printing and Publishing	Iron and Steel Mills	Other Primary Metals	Fabricated and Structural Metals	Metal Stamping, Pressing and Coating	Other Metal Fabricating Industries	Miscel- laneous Machinery	Motor Vehicles and Aircraft	Other Trans- portation Equipment	Industry No.
23	24	25	26	27	28	29	30	31	32	
0.01330	0.01115	0.00712	0.00802	0.00571	0.00805	0.00826	0.00744	0.00841	0.00798	1
0.04430	0.01220	0.16005	0.08320	0.06306	0.07728	0.05417	0.05509	0.03737	0.05011	2
0.00592	0.00606	0.00341	0.00332	0.00268	0.00351	0.00366	0.00322	0.00363	0.00403	3
0.00325	0.00348	0.00177	0.00173	0.00148	0.00183	0.00202	0.00184	0.00179	0.00169	4
0.00250	0.00208	0.00126	0.00135	0.00101	0.00151	0.00143	0.00129	0.00144	0.00132	5
0.00162	0.00157	0.00078	0.00076	0.00066	0.00079	0.00089	0.00081	0.00077	0.00073	6
0.00074	0.00080	0.00043	0.00041	0.00035	0.00048	0.00047	0.00042	0.00044	0.00041	7
0.01020	0.00607	0.00344	0.00350	0.00265	0.00636	0.00368	0.00339	0.00428	0.00338	8
0.00073	0.00092	0.00054	0.00048	0.00043	0.00050	0.00057	0.00048	0.00052	0.00047	9
0.00346	0.00237	0.00174	0.00142	0.00138	0.00147	0.00173	0.00133	0.00154	0.00136	10
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11
0.00642	0.00694	0.00512	0.00471	0.00410	0.00488	0.00643	0.00408	0.04074	0.00575	12
0.00067	0.00057	0.00041	0.00037	0.00032	0.00039	0.00050	0.00033	0.00088	0.00513	13
0.00312	0.00141	0.00084	0.00099	0.00068	0.00088	0.00122	0.00092	0.00690	0.00163	14
0.00742	0.00211	0.00144	0.00175	0.00118	0.00152	0.00313	0.00151	0.01804	0.00781	15
0.00004	0.00002	0.00002	0.00002	0.00001	0.00002	0.00002	0.00002	0.00004	0.00003	16
0.00047	0.00044	0.00036	0.00039	0.00029	0.00035	0.00041	0.00034	0.00042	0.00037	17
0.01305	0.00382	0.00212	0.00250	0.00162	0.00209	0.00309	0.00241	0.02423	0.00413	18
0.00753	0.00234	0.00173	0.00347	0.00262	0.00336	0.00608	0.00488	0.00503	0.01885	19
0.00024	0.00012	0.00009	0.00014	0.00007	0.00010	0.00041	0.00011	0.00032	0.00037	20
0.02147	0.00351	0.00210	0.00543	0.00175	0.00254	0.00702	0.00711	0.00339	0.00707	21
0.28364	0.09959	0.00708	0.01181	0.00505	0.01045	0.01025	0.01285	0.01034	0.00701	22
1.00093	0.01139	0.00734	0.03276	0.00571	0.01834	0.02069	0.03302	0.01651	0.00988	23
0.04284	1.07443	0.02793	0.02181	0.02217	0.02390	0.02784	0.02082	0.02426	0.02143	24
0.02059	0.01284	1.24239	0.11700	0.45854	0.51742	0.25652	0.27557	0.14693	0.26757	25
0.03914	0.01388	0.05077	1.51885	0.03920	0.12367	0.23816	0.16095	0.13268	0.11892	26
0.00101	0.00149	0.00101	0.00200	1.00122	0.00170	0.01524	0.00123	0.00210	0.00306	27
0.00597	0.00261	0.00253	0.00968	0.00207	1.00383	0.01107	0.00340	0.00870	0.00453	28
0.02656	0.03381	0.03353	0.08768	0.06140	0.08945	1.12202	0.05474	0.05926	0.17919	29
0.00122	0.00144	0.00123	0.00205	0.00108	0.00140	0.00655	1.01406	0.00714	0.00196	30
0.00785	0.01018	0.00819	0.02145	0.00752	0.00940	0.04154	0.00893	1.41744	0.03881	31
0.00102	0.00086	0.00112	0.00330	0.00129	0.00189	0.01684	0.00296	0.00251	1.20000	32
0.00046	0.00047	0.00043	0.00209	0.00052	0.00077	0.00621	0.00401	0.00920	0.00153	33
0.00105	0.00136	0.00102	0.00109	0.00083	0.00241	0.00194	0.00107	0.00388	0.00111	34
0.00277	0.00226	0.00188	0.00317	0.00143	0.00189	0.00418	0.00162	0.01292	0.00232	35
0.00318	0.00385	0.00573	0.00558	0.00337	0.00461	0.00530	0.00313	0.00923	0.00560	36
0.01194	0.00293	0.02549	0.02095	0.01027	0.01271	0.00980	0.00908	0.00725	0.00841	37
0.00807	0.00271	0.00231	0.00263	0.00164	0.00212	0.00282	0.00242	0.02372	0.00271	38
0.02699	0.00904	0.01137	0.03430	0.00689	0.01208	0.01512	0.01550	0.01341	0.01418	39
0.05768	0.00576	0.00288	0.00448	0.00252	0.00450	0.00453	0.00423	0.01070	0.00722	40
0.00376	0.00435	0.00318	0.00381	0.00546	0.01722	0.00768	0.01009	0.01450	0.00894	41
0.00180	0.00134	0.00094	0.00087	0.00068	0.00083	0.00089	0.00073	0.00094	0.00076	42
0.10741	0.03654	0.03124	0.03388	0.01790	0.02705	0.02554	0.02140	0.03679	0.02468	43
0.01931	0.00976	0.00689	0.00640	0.00543	0.00821	0.00895	0.00616	0.01597	0.02979	44
0.02412	0.02693	0.02224	0.03401	0.01643	0.02050	0.02296	0.02020	0.02210	0.02330	45
0.16971	0.10312	0.10591	0.15080	0.08599	0.11790	0.13469	0.12304	0.14942	0.13036	46
0.03161	0.02281	0.04956	0.05646	0.02573	0.03309	0.03102	0.02450	0.02293	0.03492	47
0.14121	0.24624	0.09635	0.10675	0.08449	0.11149	0.12301	0.12343	0.10594	0.10542	48
0.14953	0.21708	0.15788	0.12056	0.12574	0.12969	0.15336	0.11454	0.13467	0.11935	49
2.61479	2.02703	2.10318	2.54014	2.09266	2.42638	2.42997	2.17071	2.58164	2.49556	50



**Table III — Total Requirements Table, Ontario, 1965 — Continued**  
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Electrical Appliances	Electrical Industrial Equipment	Communication Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non-metallic Mineral Products
	Industry	33	34	35	36	37	38
1	Agriculture, Forestry and Fishing	0.00941	0.00811	0.00904	0.01161	0.01130	0.01060
2	Mining	0.06239	0.04395	0.03906	0.04879	0.12375	0.04415
3	Meat and Poultry	0.00442	0.00442	0.00475	0.00573	0.00443	0.00590
4	Dairy Products	0.00215	0.00184	0.00200	0.00248	0.00244	0.00231
5	Grain Mills	0.00168	0.00138	0.00156	0.00207	0.00193	0.00183
6	Biscuits and Bakeries	0.00094	0.00081	0.00088	0.00108	0.00106	0.00101
7	Sugar and Confectioneries	0.00054	0.00044	0.00050	0.00066	0.00059	0.00058
8	Other Food Industries	0.00565	0.00372	0.00493	0.00751	0.00545	0.00560
9	Soft Drinks	0.00062	0.00052	0.00057	0.00078	0.00068	0.00069
10	Distilleries, Breweries and Wineries	0.00182	0.00148	0.00144	0.00213	0.00214	0.00205
11	Tobacco and Tobacco Products	0.0	0.0	0.0	0.0	0.0	0.0
12	Rubber Products	0.00572	0.00549	0.01052	0.00835	0.00667	0.03594
13	Leather and Leather Products	0.00122	0.00553	0.00430	0.00126	0.00056	0.00627
14	Cotton Yarn and Cloth	0.00112	0.00102	0.00131	0.00151	0.00151	0.00228
15	Synthetic Textiles	0.00197	0.00167	0.00335	0.00288	0.00210	0.00602
16	Knitting Mills	0.00002	0.00002	0.00002	0.00005	0.00003	0.00003
17	Clothing Industries	0.00042	0.00036	0.00037	0.00053	0.00056	0.00046
18	Other Textile Mills	0.00281	0.00229	0.00287	0.00397	0.00298	0.00594
19	Sawmills	0.00307	0.00236	0.00283	0.00330	0.00263	0.00987
20	Furniture and Fixtures	0.00066	0.00015	0.00054	0.00057	0.00012	0.00048
21	Other Wood Industries	0.00637	0.00401	0.00517	0.00445	0.00391	0.00514
22	Pulp and Paper Mills	0.02002	0.00967	0.01602	0.02399	0.02454	0.03667
23	Paper Products	0.06107	0.01797	0.03446	0.04954	0.01940	0.01155
24	Printing and Publishing	0.02963	0.02346	0.02325	0.03480	0.03332	0.03282
25	Iron and Steel Mills	0.30904	0.18818	0.09157	0.15642	0.03496	0.01552
26	Other Primary Metals	0.18045	0.26436	0.36308	0.29447	0.01980	0.02000
27	Fabricated and Structural Metals	0.00130	0.00099	0.00111	0.00148	0.00136	0.00108
28	Metal Stamping, Pressing and Coating	0.00474	0.00383	0.00483	0.00755	0.00322	0.00407
29	Other Metal Fabricating Industries	0.05290	0.03617	0.03885	0.05746	0.05142	0.02946
30	Miscellaneous Machinery	0.00135	0.00116	0.00123	0.00163	0.00155	0.00132
31	Motor Vehicles and Aircraft	0.01046	0.01054	0.01158	0.01752	0.01005	0.00882
32	Other Transportation Equipment	0.00147	0.00122	0.00138	0.00173	0.00157	0.00098
33	Electrical Appliances	1.00941	0.00147	0.00077	0.00117	0.00054	0.00044
34	Electrical Industrial Equipment	0.07772	1.00320	0.01003	0.00171	0.00122	0.00117
35	Communication Equipment	0.01291	0.05557	1.15447	0.03813	0.00207	0.00266
36	Other Electrical Products	0.01237	0.08333	0.00849	1.02309	0.00363	0.01336
37	Clay, Lime and Cement	0.01012	0.00911	0.00917	0.01009	1.15233	0.05806
38	Other Non-metallic Mineral Products	0.00589	0.02496	0.02574	0.01280	0.01780	1.23213
39	Petroleum Refineries and Coal Products	0.01845	0.01417	0.01954	0.02094	0.02675	0.03090
40	Plastics and Synthetic Resins	0.02608	0.01301	0.03355	0.05884	0.00557	0.01350
41	Paint and Varnish	0.02196	0.00681	0.00909	0.01196	0.00389	0.00403
42	Pharmaceuticals and Medicines	0.00115	0.00086	0.00104	0.00167	0.00107	0.00138
43	Other Chemical Industries	0.04747	0.02971	0.04659	0.08566	0.02909	0.06161
44	Miscellaneous Manufacturing Industries	0.01043	0.01053	0.01054	0.05578	0.00889	0.01134
45	Construction, Maintenance and Repair	0.02197	0.01966	0.02226	0.02407	0.02678	0.02612
46	Transportation, Storage and Trade	0.14186	0.12155	0.13287	0.16828	0.20590	0.14763
47	Utilities	0.03244	0.02733	0.02761	0.03117	0.03458	0.06718
48	Communications and Other Services	0.12795	0.11527	0.13294	0.14539	0.14390	0.13380
49	Unallocated Sector	0.15548	0.13027	0.12374	0.18447	0.18727	0.17778
50	<b>Total</b>	2.51910	2.31389	2.45181	2.63150	2.22729	2.33476

Note: Figures may not add to total due to rounding.



39	40	41	42	43	44	45	46	47	48	49	Industry No.
0.01176	0.03482	0.03344	0.02265	0.03878	0.01739	0.01326	0.02851	0.00398	0.02483	0.03288	1
0.68816	0.07029	0.04908	0.02937	0.08828	0.03122	0.04461	0.02246	0.01723	0.00902	0.02619	2
0.00548	0.02415	0.01651	0.00957	0.03057	0.00967	0.00305	0.00388	0.00180	0.01591	0.01708	3
0.00213	0.00332	0.00376	0.00436	0.00332	0.00277	0.00163	0.00246	0.00111	0.01104	0.00969	4
0.00201	0.00698	0.00771	0.00452	0.00737	0.00290	0.00184	0.00390	0.00068	0.00480	0.00608	5
0.00090	0.00112	0.00123	0.00171	0.00111	0.00117	0.00070	0.00087	0.00050	0.00516	0.00431	6
0.00058	0.00198	0.00215	0.00713	0.00203	0.00088	0.00039	0.00053	0.00024	0.00219	0.00232	7
0.00693	0.05335	0.07002	0.02803	0.05219	0.01171	0.00339	0.00332	0.00152	0.01137	0.01512	8
0.00068	0.00246	0.00135	0.00502	0.00248	0.00097	0.00040	0.00049	0.00027	0.00207	0.00317	9
0.00169	0.00242	0.00248	0.00350	0.00248	0.00233	0.00104	0.00202	0.00060	0.00089	0.01215	10
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11
0.00562	0.01458	0.01780	0.01251	0.01287	0.03824	0.00779	0.00676	0.00205	0.00314	0.03391	12
0.00075	0.00333	0.00120	0.00137	0.00215	0.01203	0.00059	0.00037	0.00016	0.00041	0.00254	13
0.00123	0.00226	0.00174	0.00186	0.00178	0.00672	0.00200	0.00275	0.00050	0.00294	0.00417	14
0.00205	0.00502	0.00382	0.00340	0.00392	0.01641	0.00436	0.00383	0.00075	0.00179	0.00792	15
0.00003	0.00010	0.00004	0.00004	0.00004	0.00056	0.00003	0.00008	0.00001	0.00002	0.00010	16
0.00051	0.00066	0.00058	0.00068	0.00061	0.00117	0.00041	0.00188	0.00015	0.00029	0.00199	17
0.00352	0.00708	0.00424	0.00474	0.00563	0.02176	0.00962	0.00481	0.00130	0.00327	0.01043	18
0.00315	0.00599	0.00271	0.00331	0.00377	0.02093	0.04248	0.00286	0.00605	0.00361	0.00434	19
0.00015	0.00037	0.00014	0.00018	0.00017	0.00197	0.00192	0.00014	0.00015	0.00022	0.00028	20
0.00360	0.00776	0.00318	0.00401	0.00448	0.02193	0.04238	0.00241	0.00343	0.00443	0.00480	21
0.00884	0.03332	0.02035	0.03585	0.03595	0.03669	0.01329	0.00843	0.00263	0.00537	0.03318	22
0.0052	0.04654	0.03220	0.07613	0.04997	0.03945	0.01719	0.01234	0.00302	0.00633	0.03193	23
0.02580	0.03892	0.04415	0.07455	0.03917	0.04302	0.01480	0.02065	0.00980	0.01527	0.19786	24
0.04988	0.03650	0.04426	0.03110	0.03712	0.05800	0.07217	0.01147	0.00823	0.00944	0.05005	25
0.03421	0.03586	0.02509	0.02318	0.03285	0.08015	0.08786	0.01055	0.00914	0.01031	0.05215	26
0.00183	0.00166	0.00122	0.00133	0.00153	0.00293	0.02593	0.00111	0.00195	0.00193	0.00301	27
0.02004	0.02880	0.05848	0.02981	0.03100	0.03527	0.01539	0.00324	0.00165	0.00268	0.00747	28
0.04665	0.03810	0.03665	0.04534	0.03755	0.05303	0.10597	0.02075	0.01414	0.01743	0.14674	29
0.00189	0.00188	0.00175	0.00201	0.00184	0.00248	0.00406	0.00190	0.00270	0.00186	0.00571	30
0.00836	0.01006	0.01047	0.01460	0.00987	0.01198	0.00964	0.01030	0.00294	0.00412	0.05130	31
0.00243	0.00141	0.00124	0.00131	0.00144	0.00183	0.00223	0.00350	0.00039	0.00047	0.00351	32
0.00052	0.00141	0.00059	0.00072	0.00061	0.00787	0.00207	0.00033	0.00025	0.00030	0.00212	33
0.00115	0.00199	0.00150	0.00196	0.00147	0.00596	0.00675	0.00084	0.00074	0.00088	0.00643	34
0.00307	0.01495	0.00622	0.00361	0.01472	0.00864	0.02210	0.00166	0.00192	0.00215	0.00821	35
0.00336	0.00683	0.00481	0.00632	0.00636	0.01495	0.01502	0.00258	0.00183	0.00224	0.01831	36
0.00784	0.00969	0.00595	0.00755	0.00586	0.00653	0.06383	0.00271	0.00478	0.00485	0.00524	37
0.00322	0.01309	0.00918	0.09108	0.01483	0.01721	0.01743	0.00209	0.00171	0.00246	0.01003	38
1.10870	0.06354	0.03867	0.02027	0.07946	0.02072	0.02547	0.02999	0.01104	0.00860	0.02108	39
0.00466	1.11515	0.07979	0.01324	0.02349	0.13673	0.00613	0.00315	0.00117	0.00233	0.01479	40
0.00866	0.01266	1.06584	0.00655	0.00703	0.01028	0.00855	0.00260	0.00158	0.00316	0.02035	41
0.00176	0.01040	0.00529	1.03327	0.01440	0.00238	0.00070	0.00070	0.00034	0.00161	0.00475	42
0.10734	0.88380	0.40191	0.10607	1.25476	0.14310	0.02495	0.01473	0.00676	0.01318	0.07088	43
0.00873	0.14772	0.02402	0.02456	0.02680	1.11662	0.01343	0.00672	0.00295	0.00607	0.04324	44
0.04870	0.03200	0.02546	0.02685	0.03125	0.02369	1.01718	0.03228	0.07257	0.06947	0.03784	45
0.20853	0.17580	0.17782	0.17904	0.17930	0.15392	0.18661	1.12274	0.04968	0.05946	0.38137	46
0.04592	0.04889	0.02860	0.02120	0.05460	0.02634	0.01641	0.01469	1.22646	0.00760	0.01952	47
0.13006	0.14919	0.16900	0.22186	0.14802	0.15790	0.11661	0.13973	0.08678	1.13676	0.39831	48
0.14284	0.19337	0.21040	0.30955	0.19135	0.20456	0.08036	0.11057	0.05311	0.07908	1.13717	49
2.78940	3.40155	2.75407	2.55686	2.59661	2.64495	2.17404	1.68667	1.62275	1.58276	2.98204	50



**Sectoral Classification of the 1965 Ontario Input-Output Table —  
Industry Titles and Definitions on the Basis of the Standard Industrial Classification**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
1	Agriculture, Forestry and Fishing	011, 013, 015, 017, 019, 021, 031, 039, 041, 045, 047
2	Mining	058, 051, 052, 053, 054, 055, 056, 057, 059, 061, 063, 065, 066, 071, 073, 077, 079, 083, 087, 092, 094, 096, 098, 099
3	Meat and Poultry	101, 103
4	Dairy Products	105, 107
5	Grain Mills	123, 124, 125
6	Biscuits and Bakeries	128, 129
7	Sugar and Confectioneries	131, 133
8	Other Food Industries	111, 112, 135, 139
9	Soft Drinks	141
10	Distilleries, Breweries and Wineries	143, 145, 147
11	Tobacco and Tobacco Products	151, 153
12	Rubber Products	161, 163, 169
13	Leather and Leather Products	172, 174, 175, 179
14	Cotton Yarn and Cloth	183
15	Synthetic Textiles	201
16	Knitting Mills	231, 239
17	Clothing Industries	243, 244, 245, 246, 247, 248, 249
18	Other Textile Mills	193, 197, 211, 212, 213, 214, 215, 216, 218, 219, 221, 223, 229
19	Sawmills	251
20	Furniture and Fixtures	261, 264, 266, 268
21	Other Wood Industries	252, 254, 256, 258, 259
22	Pulp and Paper Mills	271
23	Paper Products	272, 273, 274
24	Printing and Publishing	286, 288, 289, 287
25	Iron and Steel Mills	291
26	Other Primary Metals Industries	292, 294, 295, 296, 297, 298
27	Fabricated and Structural Metals	302
28	Metal Stamping, Pressing and Coating	304
29	Other Metal Fabricating Industries	301, 303, 305, 306, 307, 308, 309, 315
30	Miscellaneous Machinery	311, 316, 318
31	Motor Vehicles and Aircraft	321, 323, 324, 325
32	Other Transportation Equipment	326, 327, 328, 329
33	Electrical Appliances	331, 332
34	Electrical Industrial Equipments	336
35	Communication Equipment	334, 335, 338
36	Other Electrical Equipment	337, 339
37	Clay, Lime and Cement	341, 343, 345, 347, 348, 351, 352, 353
38	Other non-metallic Mineral Products	354, 355, 356, 357, 359
39	Petroleum Refineries and Coal Products	365, 369
40	Plastics and Synthetic Resins	373
41	Paint and Varnish	375
42	Pharmaceuticals and Medicines	374
43	Other Chemical Industries	371, 372, 377, 378, 379
44	Miscellaneous Manufacturing Industries	381, 382, 383, 384, 385, 393, 395, 397, 398, 399
45	Construction, Maintenance and Repair	404, 406, 409, 421



**Sectoral Classification of the 1965 Ontario Input-Output Table —  
Industry Titles and Definitions on the Basis of the Standard Industrial Classification  
(Continued)**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
46	Transportation, Storage and Trade	602, 604, 606, 608, 611, 613, 614, 615, 616, 617, 618, 619, 621, 622, 623, 624, 625, 626, 627, 629, 631, 642, 647, 649, 652, 654, 656, 658, 663, 665, 667, 669, 673, 676, 678, 681, 691, 692, 693, 694, 695, 696, 697, 699, 501, 502, 504, 505, 506, 507, 508, 509, 512, 515, 516, 517, 519, 524, 527
47	Utilities	572, 574, 576, 579
48	Communications and Other Services	543, 544, 545, 548, 801, 803, 805, 807, 809, 821, 823, 825, 827, 828, 842, 851, 853, 859, 871, 872, 873, 874, 875, 876, 877, 878, 879, 894, 896, 897, 702, 704, 731, 735, 861, 862, 864, 866, 869, 737, 831, 891, 893, 899
49	Unallocated Sector	



# Selected Economic Indicators

## Leading Indicators

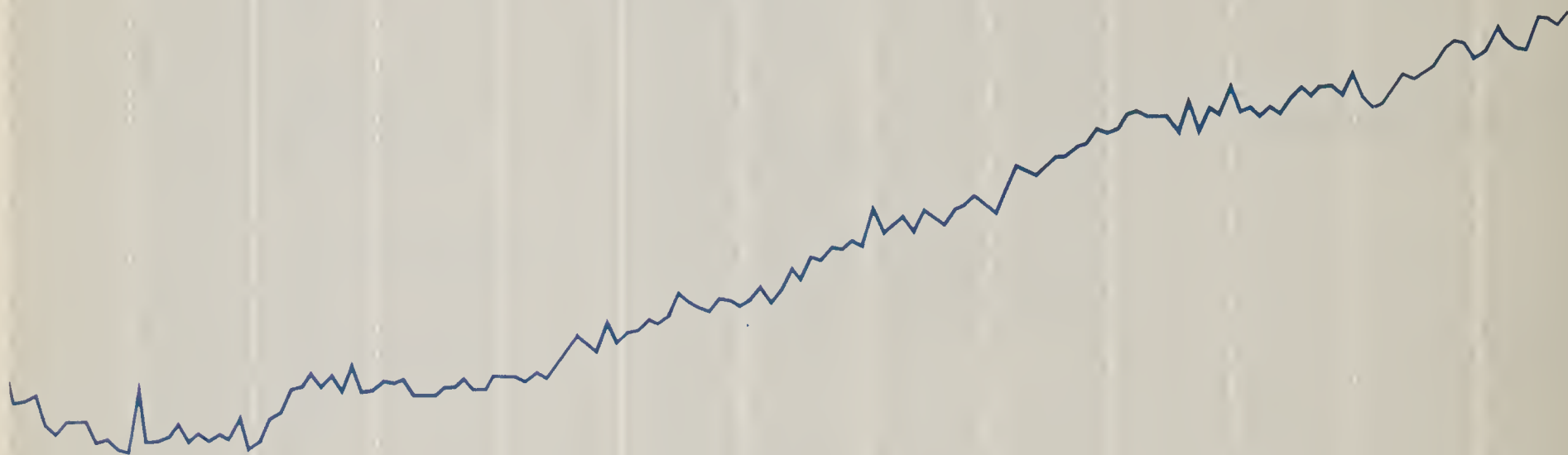
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)

Number  
Scale A  
\_42  
\_41  
\_40  
\_39



New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)

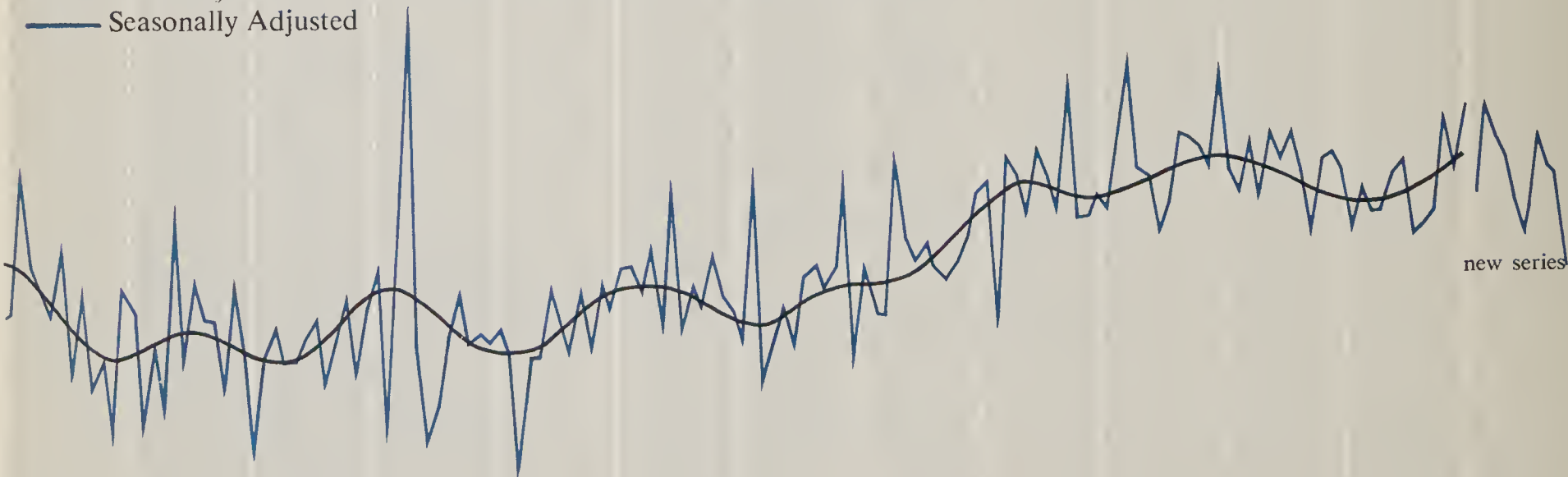
\$ Billion  
Scale L1  
\_4.0  
\_3.5  
\_3.0  
\_2.5  
\_2.0



Commercial/Institutional and Industrial Construction Contracts, Ontario

— Trend Cycle  
— Seasonally Adjusted

\$ Million  
Scale L2  
\_200  
\_160  
\_120  
\_100  
\_80  
\_60  
\_40



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

— Quarterly  
— Monthly

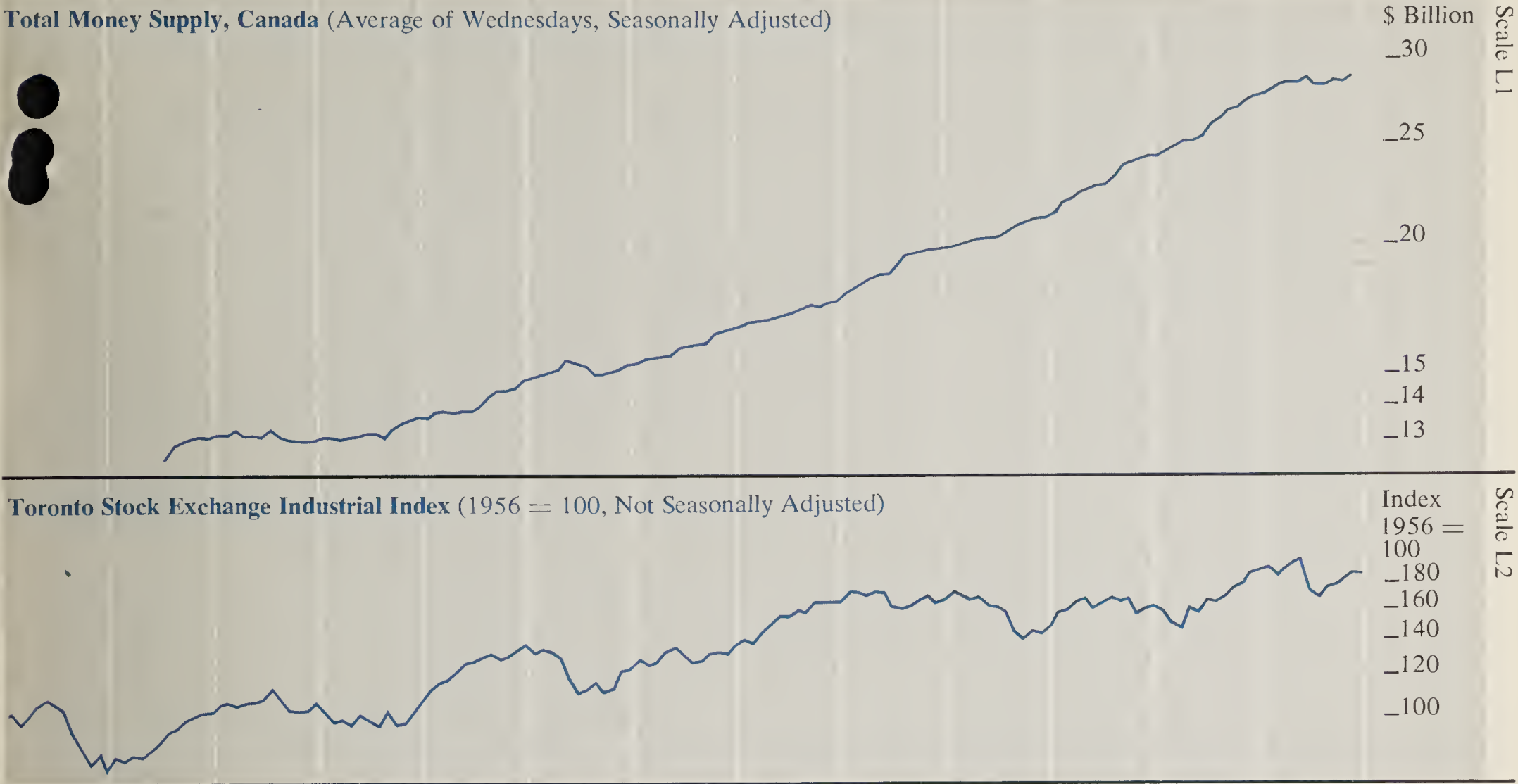
Thousand  
Scale L2  
\_100  
\_90  
\_80  
\_70  
\_60  
\_50  
\_40



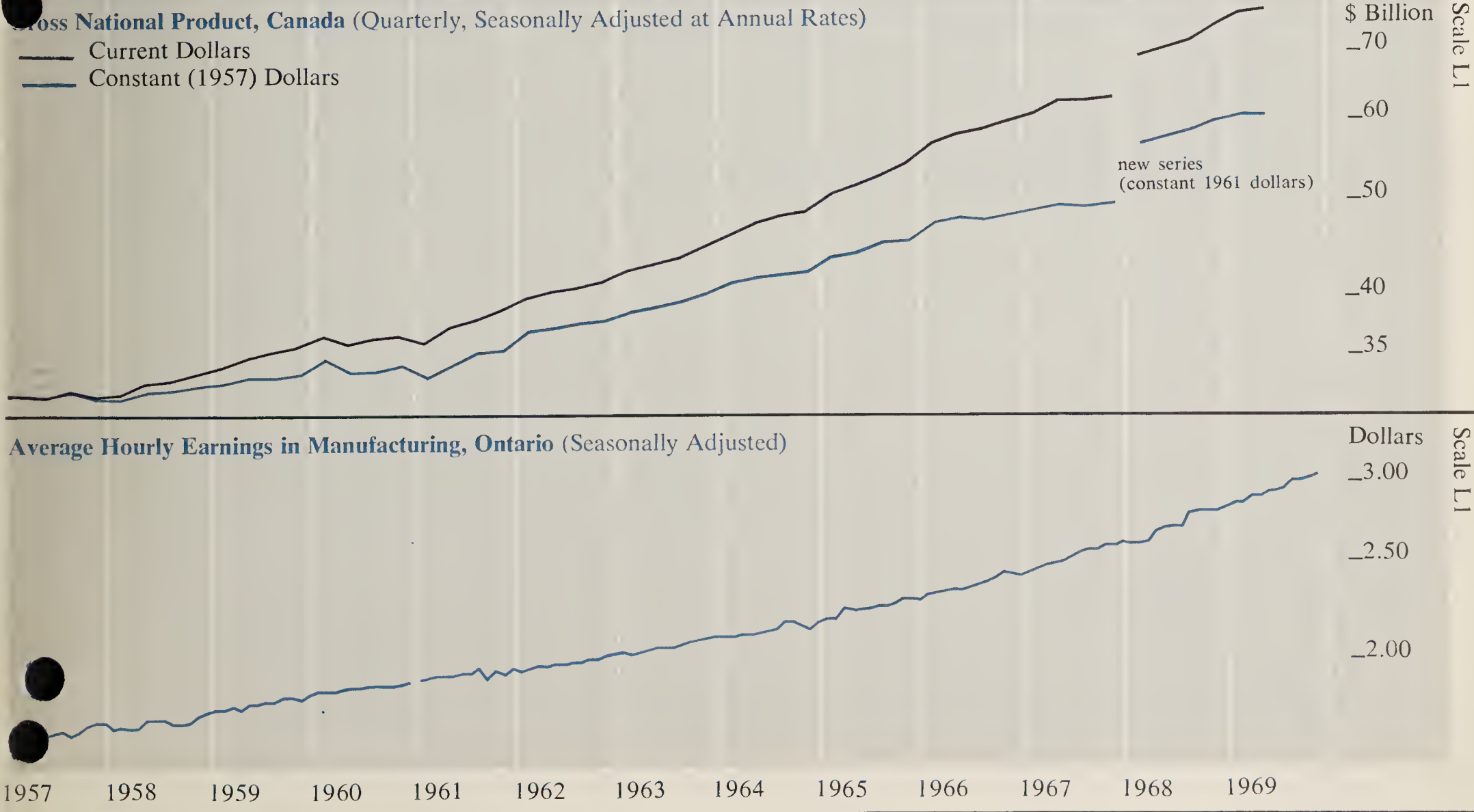
1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969



# Leading Indicators



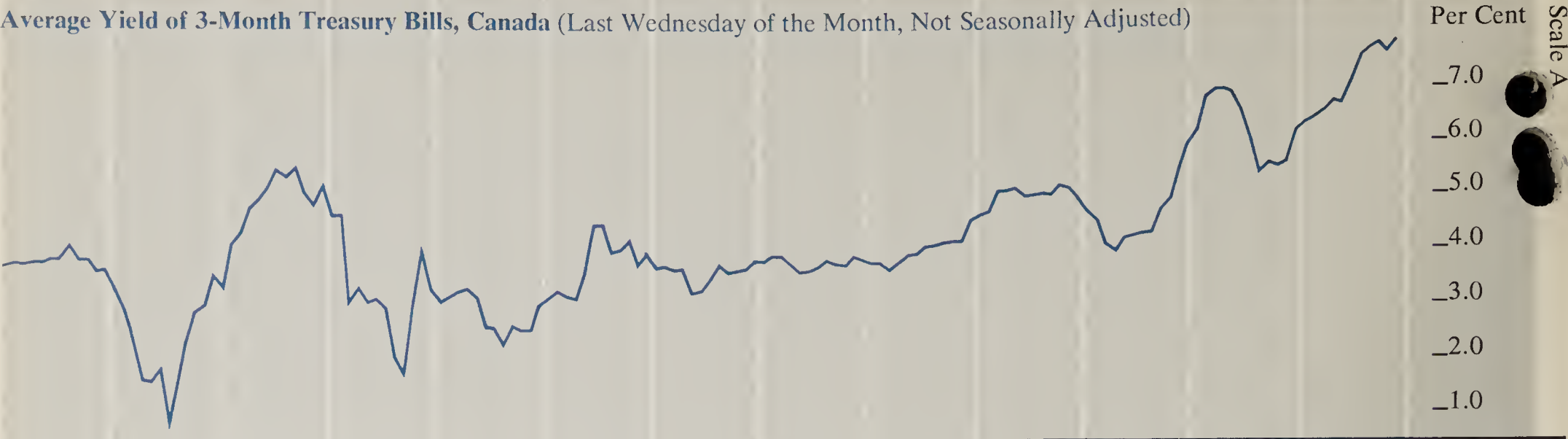
# Coincidental and Lagging Indicators





# Coincidental and Lagging Indicators

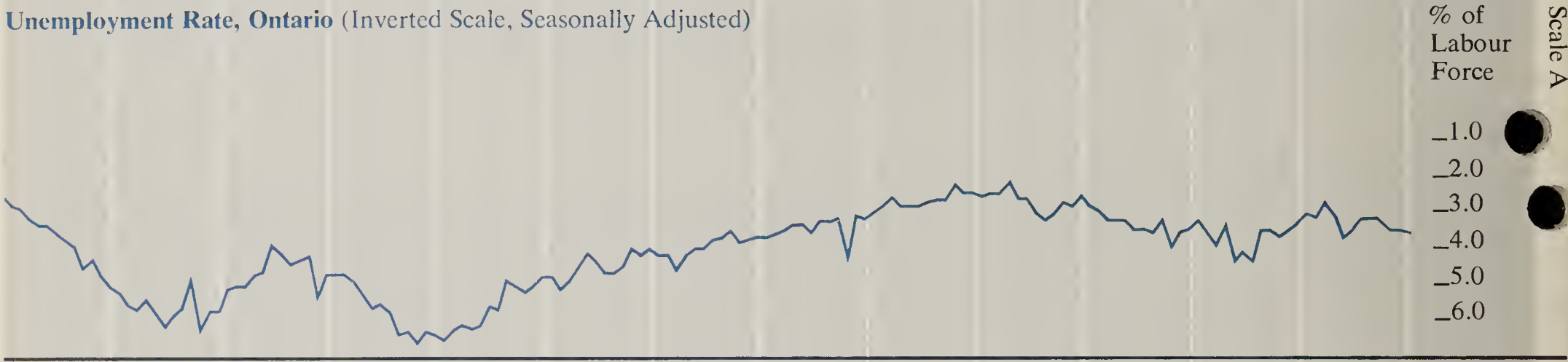
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



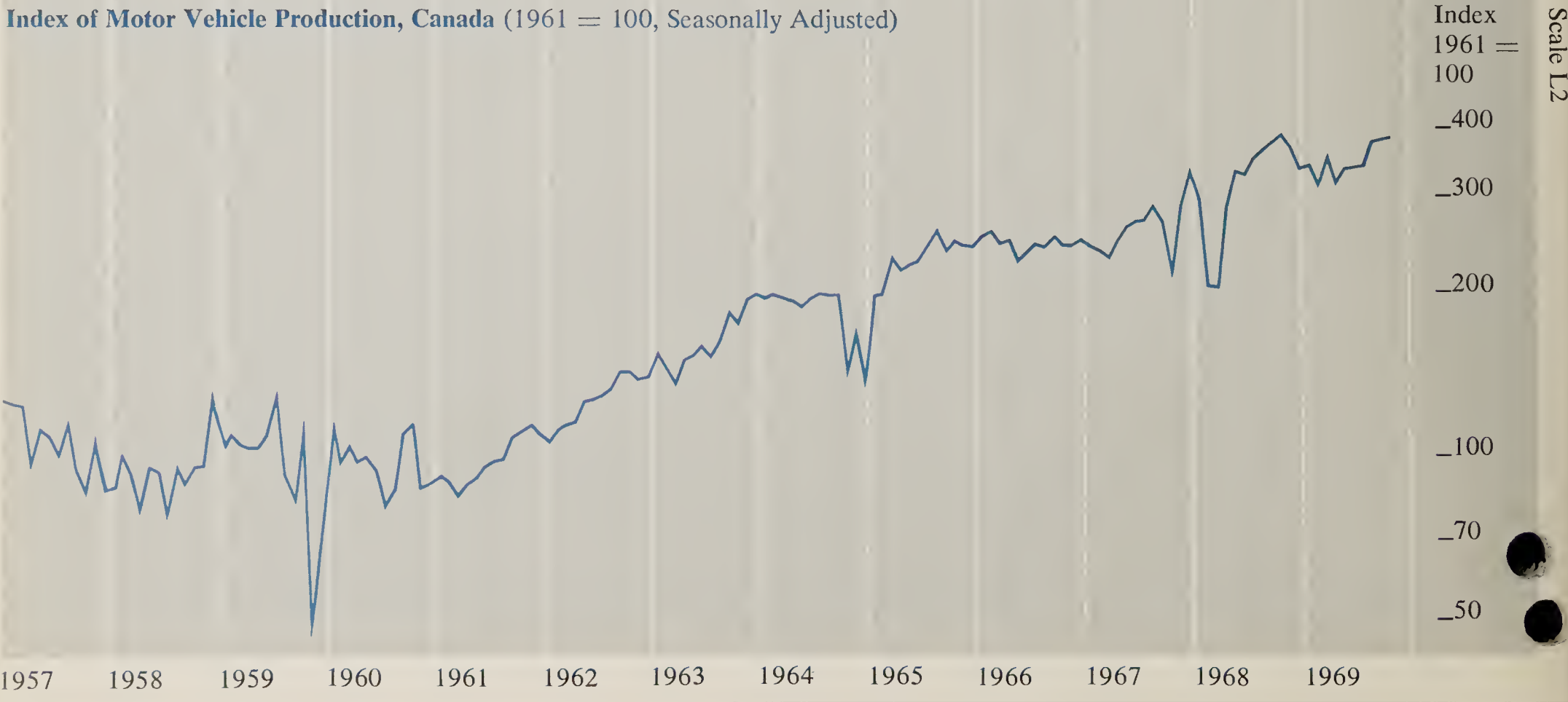
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)





1968 1969

	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Average Weekly Hours Worked in Manufacturing	40.7	40.1	40.5	40.4	40.5	40.1	40.4	40.1	40.2	39.6	40.3	39.9	39.9	
New Orders in Manufacturing Industries <sup>c</sup>	3,577	3,430	3,518	3,693	3,575	3,539	3,564	3,743	3,741	3,690	3,770	3,634	3,741	
Commercial/Institutional and Industrial Construction Contracts	125.0	155.0	111.9	157.9	140.6	126.1	112.8	93.9	144.0	127.0	123.2	86.6		
Urban Housing Starts (Annual Rate)	83,500	98,200	80,800	109,700	102,400	79,900	45,300	63,900	60,800	69,300	67,300	78,300	59,100	61,400
Money Supply <sup>c</sup>	27,124	27,400	27,669	27,927	28,251	28,331	28,336	28,638	28,324	28,292	28,403	28,472	28,680	
T.S.E. Industrial Index <sup>u</sup>	187.29	188.93	192.47	185.20	190.58	195.31	197.23	177.34	168.65	175.43	178.15	182.11	187.65	186.37
Business Failures <sup>u</sup>	48	34	57	59	55	58	48	35	32	51	52	64	54	53
Business Failures — Liabilities <sup>u</sup>	2.5	1.2	2.9	3.2	2.2	3.2	1.9	2.0	0.9	2.6	4.8	3.4	4.6	2.2

**Coincidental and Lagging Indicators**

Gross National Product <sup>c</sup> (Annual Rate)	\$ Million	74,524	76,608	77,432	78,736									
Average Hourly Earnings in Manufacturing	Dollars	2.79	2.84	2.84	2.84	2.88	2.89	2.92	2.93	2.94	2.97	2.97	2.99	3.02
3-Month Treasury Bill Rate <sup>c,u</sup>	Per Cent	5.66	6.24	6.38	6.43	6.58	6.80	6.74	7.13	7.62	7.69	7.77	7.60	7.76
Cheques Cashed in Clearing Centres <sup>1</sup>	\$ Million	5,846	5,757	5,820	6,032	6,428	6,243	6,066	6,152	6,458	6,560	6,570	6,526	6,521
Retail Trade	\$ Million	862	853	879	886	862	866	866	875	884	886	901	892	895
Labour Force	000's	3,026	2,977	3,010	3,037	3,019	3,038	3,071	3,035	3,028	3,004	3,027	3,035	3,030
Employed	000's	2,923	2,879	2,928	2,947	2,940	2,948	2,958	2,926	2,935	2,910	2,932	2,930	2,927
Unemployed	000's	103	98	82	90	79	90	113	109	93	94	95	105	103
Unemployed as % of Labour Force	Per Cent	3.4	3.3	2.7	3.0	2.6	3.0	3.7	3.6	3.1	3.1	3.1	3.4	3.4
Wages and Salaries	\$ Million	1,223	1,224	1,239	1,256	1,264	1,271	1,288	1,295	1,318	1,303	1,309	1,314	
Index of Industrial Employment	1961 = 100	128.6	129.3	130.5	131.2	131.5	131.4	131.4	131.0	129.6	129.3	129.6	130.7	132.7
														132.9

**Index of Industrial Production<sup>c</sup>**

Total Manufacturing <sup>c</sup>	1961 = 100	165.7	166.0	165.8	168.0	171.3	167.7	167.0	167.1	166.8	164.5	165.9	165.6	169.2	171.5
Non-Durables <sup>c</sup>		165.9	165.7	164.2	167.5	171.3	167.3	168.5	169.0	169.3	166.5	166.8	166.7	169.3	170.2
Durables <sup>c</sup>		148.0	149.8	147.6	150.8	153.6	150.2	150.6	151.1	151.6	152.5	153.0	152.4	153.1	153.6
Mining <sup>c</sup>		187.8	185.0	184.5	187.8	193.0	188.2	190.3	190.8	191.0	183.7	183.8	184.1	189.1	190.5
Electric Power and Gas Utilities <sup>c</sup>		155.1	154.4	159.7	160.6	162.1	155.7	145.5	142.6	138.9	136.2	141.8	140.3	151.8	163.1
Primary Energy Demand (Annual Rate)	BKWH	179.7	186.7	189.5	184.3	184.7	186.2	186.1	187.1	189.0	190.1	194.6	195.5	194.6	195.6
Exports (including re-exports) <sup>c</sup>	\$ Million	57.89	59.81	59.83	58.45	59.49	59.20	58.54	59.12	60.28	58.83	58.39	59.09	59.56	63.13
Imports <sup>c</sup>	\$ Million	1,203.2	1,201.8	1,204.8	1,243.8	1,295.7	1,194.2	1,233.6	1,212.5	1,196.0	1,161.7	1,319.8	1,263.0	1,253.0	1,328.9
		1,084.3	1,106.0	1,149.0	1,194.2	1,178.3	1,149.3	1,166.6	1,215.2	1,124.2	1,136.3	1,243.1	1,191.7	1,225.0	1,214.0

**Unclassified Indicators**

Foreign Exchange Reserves <sup>c,u</sup>	U.S. \$ Million	2,672	2,827	2,864	2,820	2,779	2,782	2,760	2,623	2,565	2,594	2,539	2,629	2,613	
Industrial Materials Price Index <sup>c,u</sup>	1935-39 = 100	257.1	258.9	261.4	263.5	264.1	267.7	271.8	270.6	270.5	269.2	270.4	266.8	267.8	271.5
Consumer Price Index <sup>c,u</sup>	1961 = 100	121.9	122.3	122.6	122.6	123.2	124.6	124.9	125.9	126.4	126.9	126.6	126.8	127.4	127.9

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>1</sup>Ontario less Toronto.







# Ontario Economic Review

---

**March / April 1970**  
**Volume 8, Number 2**

**Treasury Department—Finance and Economics**

**Hon. Charles S. MacNaughton, Treasurer of Ontario**  
**H. Ian Macdonald, Deputy Minister**

HA  
747  
.0656

1970  
Mar/Apr  
c.1 BAS

# Ontario Economic Review

March/April 1970  
Volume 8, Number 2

## The Ontario Economy

## Economic Aspects of Environmental Quality for Ontario

H. J. McGonigal, *Economist*  
Department of Treasury and Economics

## Selected Economic Indicators

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. Charles S. MacNaughton  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

### About the Review

The feature article for the March/April issue of the *Ontario Economic Review* examines some of the economic aspects of pollution abatement and environmental quality improvement.

In recent years, changes in environmental quality resulting from pollution have occurred in such quantity and at such a rapid rate that neither neutralization nor accommodation is possible. Accordingly, one of the most urgent challenges now facing mankind is to halt and reverse this growing deterioration in the environment. However, the complex phenomenon of pollution is intimately interrelated with the goals and activities of advanced industrial societies. The desire for economic growth results jointly in greater affluence, and through the industrial sources of wealth, more effluents. The problem is therefore determination of the trade-offs necessary to properly order the priorities of environmental quality and economic growth.

This article is drawn in part from background documents prepared for the Federal-Provincial Conference in Ottawa, February 16-17, 1970. The problems of pollution and the proposed Canada Water Bill were among the topics receiving major attention at that conference.

Mr. McGonigal is an economist with the Economic Planning Branch, Policy Planning Division of the Department of Treasury and Economics.

### Indicator Charts, Pages 10-12

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 10-12 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

HA/747/.0656  
Ontario. Dept. of Economics and  
Ontario economic review

Mar/Apr  
gmwg

c.1

1970  
BAS



# The Ontario Economy

## Ontario Budget 1970

In his fourth Budget Statement to the Ontario Parliament on March 31, Treasurer Charles MacNaughton announced his 1970-71 budget will, as promised, achieve a balance with no tax increases. Despite a 14.1 per cent increase in spending a balanced budget will be maintained through rapidly increasing revenues from existing taxes. Based on total outlays of \$3,728 million and anticipated revenues of \$3,739 million in 1970-71 a surplus of \$11 million is forecast.

Describing his budget as "moderately expansionary", reflecting his concern that tight money and fiscal policies could bring about a recession and higher unemployment, Mr. MacNaughton announced five new programs directed at priority concerns of the province; the plight of pensioners, pollution, housing and municipal finance.

Pensioners who qualify for the federal Guaranteed Income Supplement and maintain an independent household will receive up to \$100 in property tax relief in addition to the recently revised basic shelter grants. The supplementary tax relief grants will be available to tenants as well as homeowners, but not to pensioners living in institutions or in subsidized senior citizen housing. Pensioners in these categories are already sheltered from rising property tax burdens. The supplement will benefit approximately 200,000 tenants and homeowners.

This new program recognizes that pensioners with little or no outside income have been hardest hit by inflation and are least able to pay property taxes and rising rents.

A grant and loan system to encourage industry to reduce pollution was also introduced. Incentives for pollution control include tax-expenditure grants equivalent to the five per cent retail sales tax on approved equipment; loans to small businesses to purchase anti-pollution equipment; tax-related grants to municipalities, school boards, hospitals and universities; capital assistance to small municipalities for sewage treatment plants and water pipelines; and accelerated depreciation allowances similar to those announced recently by the federal government. The new pollution incentives will add approximately \$15 million to the cost of existing anti-pollution programs of the government.

As part of its expanding program to provide a high level of health care in Ontario, the province intends to broaden the benefits available under the Ontario Health Services

Insurance Plan. Beginning on July 1, 1970 certain services provided by chiropractors, podiatrists and osteopaths will be eligible as insured service under OHSIP. It will be necessary, however, to prescribe annual limits on these services. The specific details of this extended coverage will be outlined at a later date by the Minister of Health.

To fortify the supply of mortgage money for home ownership the Ontario Government proposes to set up a \$50 million capital fund under the Housing Corporation Limited to provide first and second mortgages to purchasers of new dwellings. This initial allocation of \$50 million will finance approximately 3,000 mortgages. The interest rate on these mortgages will be the same as the rate for direct loans made by the Central Mortgage and Housing Corporation. The terms will include a maximum loan of 95 per cent of the lending value of the dwelling and repayment periods up to 35 years.

Continuing the staged program of provincial-municipal tax reform which was outlined in detail in Ontario's 1969 white paper the province will this year pay an additional \$125 million to help local authorities maintain or reduce present property taxes. The \$125 million covers new or increased grant programs in education, roads, servicing projects and regional government; the cost of provincial assessment and the initial step toward broadening the municipal tax base. More than half of the additional amount will go to school boards. Education Minister William Davis announced recently that the level of grants will be increased from 46.5 per cent to 51.5 per cent of school board expenditures.

The property assessment function, which the province took over from municipalities on January 1, 1970, will cost \$21 million. Increased grants for road expenditures by cities and separated towns are estimated at \$12 million. Regional and district governments will receive over \$12 million in increased assistance. Subsidies for amortization of sewerage and water projects, and water pipelines will cost \$1 million.

For the first time, municipalities will be able to collect revenues from universities which previously were exempt from property taxes. The province will provide \$2.5 million in grants, equivalent to \$25 per full-time pupil, to 17 cities which service university properties. The interim tax formula of \$25 per student will be replaced by the normal method of taxing when university properties

have been evaluated under the province's reassessment program.

The government's long-run plan is to pay full local taxes on all properties of the province, its agencies and the institutions it supports. The program will be phased in as revenues become available to finance it.

The government will also establish a new loan fund of \$10 million for municipalities with populations under 10,000, through the Ontario Municipal Improvement Corporation. Borrowing problems of larger municipalities will be reviewed to determine their needs for debt-raising capacity.

In addition, as mentioned above, the province will provide municipalities, schools, hospitals and universities with grants equivalent to the Ontario retail sales tax on purchases of approved pollution control equipment, water treatment facilities and incinerators.

## Tax Changes

Reversing recent trends toward ever increasing taxes Mr. MacNaughton announced selective tax relief in three major areas: succession duties; retail sales tax on certain production goods; and corporation tax relief for environmental pollution control.

As of midnight March 31, 1970 the succession duty exemption for widows is raised from the present \$75,000 to \$125,000. This will mean that less than one per cent of the estates assessed will involve duty payable by a widow. The same exemption will be granted to widowers and, under certain circumstances, to surviving common-law wives and husbands. The changes will also provide for relief on a pension benefit transferred to the surviving spouse. Previously the annuity was valued on the basis of the widow's life expectancy. An amendment will provide for an advantageous reassessment if the widow dies or remarries within four years of the death of her husband.

The Treasurer stated that the increased exemptions are a move toward his 1969 commitment to phase out succession duties with the introduction of a capital gains tax. He also expressed concern that the federal tax proposals, which include a capital gains tax, did not provide any compensating relief in estates taxation.

The second area of tax relief pertains to the application of the retail sales tax to certain production goods. In 1969 the retail sales tax was extended to cover production machinery in general. Following intensive



analysis of this area the government is now prepared to eliminate the sales tax on short-life production tools such as jigs, dies, explosives and fire bricks. This amendment specifies a variety of production items that are subject to rapid replacement and high wear-and-tear. The exemption will help to reduce the cost of goods, particularly in those industries where short-life tools account for a high proportion of production expenses.

The third area of tax relief relates to the high priority that has been given to the problem of bringing all forms of environmental pollution under control. Ontario now joins the federal government in providing for accelerated write-off of the capital costs of industrial pollution control equipment. These investments can be depreciated in two years under corporation tax provisions of both governments.

#### **Federal Budget — 1970-1971**

Finance Minister E. J. Benson presented his third budget to Parliament on March 12, 1970. Reviewing the current economic setting, Mr. Benson said that although budgetary analysis indicates the pace of the economy is slowing rapidly the pressure of rising costs and prices is still unacceptably strong. He also predicted that in spite of the variety of restraining measures introduced over the past 18 months inflation will continue to be a difficult and persistent problem throughout 1970. Accordingly, he proposes additional specific restraints upon the economy to maintain the pressure against price and cost increases.

As alternatives to tax increases — which are absent in this budget — the Finance Minister brought forth two special measures to reinforce the fight against inflation.

The first concerns commercial construction. Singling out the construction industry as a leader in the inflationary spiral, even though the total volume of construction has not increased significantly since 1966, Mr. Benson called for a continuation to the end of 1970 of the capital cost allowance deferrals introduced in June 1969. This proposal singles out commercial construction in the urban centres of over 50,000 population in Ontario, Alberta and British Columbia and postpones for two years the right to claim depreciation for tax purposes on commercial construction begun in the specified centres.

The second proposal concerns measures to cut back the rapid growth in the use of consumer credit which rose to a record total of

\$10.7 billion at the end of 1969. This was \$1.2 billion more than the amount outstanding at the end of 1968 and represented an increase of 13.0 per cent. The amount outstanding annually through sales financed by consumer credit has increased at an average of 11.0 per cent a year through the Nineteen Sixties.

Under the new regulations, which will be enacted into law in the House of Commons in six to eight weeks, credit sales of more than \$100 will require a minimum of 20 per cent down payment if they are being financed for more than one year. Repayment is required within 24 months in the case of all such purchases, except automobiles. On automobile purchases the repayment period is extended to 30 months and the amount received on a trade-in of another car will be allowed to count as part of the 20 per cent down payment, however this will not apply on the purchase of appliances.

The purpose of the proposed action is to limit the growth of consumer expenditures in the present inflationary situation not only on consumer durables but other goods and services such as travel.

Other budget highlights include:

- An extension of the 50 per cent rate of capital cost allowance on facilities to prevent, reduce or eliminate water pollution to the end of 1973. The two-year write-off will also be available for air pollution abatement facilities for the first time.
- Real growth in the gross national product is expected to be approximately 3.0 per cent this year, compared to 4.8 per cent in the preceding two years. Profits will decline, unemployment and labour unrest will increase, and prices are expected to rise almost as much as last year's jump of approximately 4.2 per cent. Unemployment is expected to increase by less than one percentage point to somewhere below a rate of 5.7 per cent, compared to 4.7 per cent last year.
- A budget surplus of \$250 million in the fiscal year 1970-71, based on budgetary revenues of \$13.15 billion and expenditures of \$12.9 billion. The surplus in the current fiscal year, the first in 13 years, is \$355 million, based on revenues of \$12.2 billion and expenditures of \$11.9 billion.
- Major increases in loans for housing, farmers, nuclear energy projects, foreign aid and regional economic expansion will increase net non-budgetary cash requirements to \$775 million in the coming fiscal

year, compared to \$475 million in the current year.

Increased government borrowing to meet the requirements of the expanded lending programs will probably offset to some extent the recent tendency for interest rates to decline. However, Mr. Benson predicts that the government's bank balances will stand at about \$1.0 billion at the end of the current year which should provide enough leeway for the government to time its borrowing so as not to unduly influence the capital market.

#### **The Gross National Product in 1969**

The Canadian economy maintained its pace through 1969 despite the imposition of restrictive fiscal and monetary measures and numerous labour disputes which resulted in a record number of man-hours lost. Recently published DBS figures indicate that the value of final goods and services produced rose by 9.3 per cent to a level of \$78.1 billion. The implicit price deflator for GNP rose 4.2 per cent, slightly more than the high increase of 4.0 per cent in 1968. In real terms, gross national product rose by 4.8 per cent, the same rate as in 1968.

Using the purchasing value of the Canadian dollar in 1961 as a base, GNP is \$60.8 billion. This is an increase of 4.8 per cent from the corresponding figure for 1968.

In the first quarter of 1969 widespread buoyancy of demand gave a strong initial impetus to the economy. Although this was followed by a pause in the second quarter, when the value of production rose only marginally, good advances were recorded in the third and fourth quarters. However, reviewing the pattern of growth in the last five quarters some evidence of an overall lessening in demand pressure is evident particularly in the second quarter when as a result of a 1.1 per cent price increase the volume of physical production declined by two-tenths of one per cent.

In the third quarter GNP rose by 1.7 per cent to reach a level of \$78.7 billion. This was above the advance of 0.9 per cent in the second quarter but lower than the average gain of 2.2 per cent realized since the first quarter of 1968. The third quarter was characterized by strong investment demand by businesses, increased exports, and a lower than average rate of increase in consumer demand. Although new residential construction declined after unusually high rates of increase in the first half of the year, spending on plant and equipment rose by 5.0 per cent.



This increase, the largest since the first quarter of 1968, was fairly evenly distributed between non-residential construction and machinery and equipment. Personal expenditure on goods and services rose by 1.5 per cent, the same rate as in the second quarter. This compared with increases of 2.0 per cent and over in prior quarters. A continued easing of demand pressure in consumer markets occurred despite an 8.0 per cent rise in new car sales, reflecting the earlier introduction of new models in 1969.

In the final quarter of 1969, GNP rose by 2.0 per cent to a level of \$80.3 billion, seasonally adjusted at annual rates. This increase was only slightly more than that realized in the third quarter. After allowing for a price increase of 0.5 per cent, the rise in physical volume of production was 1.4 per cent.

The pattern of demand in the fourth quarter was quite uneven. Personal expenditures on goods and services were very strong, accounting for roughly half of the increase in total demand. However, the 2.5 per cent increase in the expenditure on goods was concentrated in non-durable goods as purchases of many durables particularly new cars declined. Automotive products and machinery made up a dominant proportion of the 5.5 per cent increase in exports.

In contrast to its strong performance in the summer quarter, business capital formation rose only 1.0 per cent. Within this category, residential construction declined marginally, while non-residential construction and machinery and equipment rose at much lower rates than in the third quarter. In constant dollars, business gross fixed capital formation was practically unchanged from the third quarter level, as the small increase in machinery and equipment was entirely offset by declines in residential and non-residential construction.

On the income side in the fourth quarter a lower rate of increase in labour income was experienced as well as a second consecutive fall in corporation profits. The rise in wages and salaries of slightly more than 1.0 per cent was the smallest in two years. Preliminary data on corporation profits indicate a further decline of 2.0 per cent after a 7.0 per cent decrease in the third quarter.

While the performance of the economy in 1969 was somewhat uneven when viewed on

a quarterly basis the year as a whole presented a fairly balanced picture of growth. According to the Dominion Bureau of Statistics the two major developments were an acceleration in the rate of consumer spending and renewed high rates of business investment in plant and equipment after two years of decline. With the economy performing vigorously throughout the year, employment grew by 3.4 per cent, the same rate as the labour force itself. Consequently there was no reduction in the 4.8 per cent unemployment rate which carried over from 1968. Personal expenditure on consumer goods and services rose by 9.5 per cent to \$46.4 billion, an increase of almost \$4.0 billion from the previous year. This compares with an 8.5 per cent increase in 1968 and represents the largest percentage increase in the current expansion. Although much of the increased expenditure reflected price movements rather than real gains, the constant dollar estimates show spending rose 5.5 per cent — the largest increase since 1965. Thus consumer spending in 1969 was more than maintained regardless of sharply increasing income taxes and historically high interest rates. However, high interest rates may have affected spending on more costly consumer durables particularly automobiles, which with a 4.0 per cent rise were one of the few major items to show a substantially smaller rate of growth than in 1968 when the increase was 10.0 per cent. In our consumption-oriented economy, the purchase of cars and major household appliances is a source of instability since at very high interest rates, the cost of credit does adversely affect consumer borrowing. Reduced demand for major durables and housing could easily be an important feature of any adjustment in the economy's performance in 1970, especially since competing savings instruments have become very attractive as an alternative to more consumption.

After the very high rates of investment of 15 to 20 per cent that prevailed in the mid-sixties, business gross fixed capital formation registered a small decline in 1967 and a moderate 3.0 per cent increase in 1968. In 1969 capital investment rose by 9.0 per cent to \$14.0 billion. Business residential construction made a further substantial gain of 16.5 per cent versus 17.5 per cent in 1968 and accounted for nearly half of the total increase.

The upswing in activity in residential construction starting in the spring of 1967 and accelerating through 1968 slowed this year as a result of tight money and high mortgage rates. In Ontario, these combining factors contributed to a sharp drop in the number of anticipated housing starts with the result that in 1969 total starts exceeded those of 1968 by less than 1.0 per cent.

The acceleration in the rate of business gross fixed capital formation was due to a 7.0 per cent increase in investment in plant and equipment, a marked contrast to the declines of 1.5 per cent in 1968 and 0.5 per cent in 1967. In the case of non-residential construction, the increase of 5.0 per cent was considerably smaller than that indicated by the mid-year forecast of intentions of close to 15.0 per cent. In real terms non-residential construction declined by 3.0 per cent.

The deficit in Canada's balance of trade in goods and services increased from \$244 million in 1968 to \$938 million in 1969. The rate of increase of imports accelerated while that of exports declined. Exports of goods and services totalled \$18.4 billion, up from \$16.7 billion, but imports rose to \$19.3 billion from \$16.9 billion. One reason for the large increase in service imports was a 27.0 per cent increase in Canadian tourist and travel expenditures abroad last year.

On the income side, wages and salaries rose by 12.0 per cent to \$43.1 billion from \$38.5 billion in 1968, the largest increase since 1966. Within the year, however, there was a deceleration in the quarterly rate of increases in labour income, from a 3.5 per cent increase in the last quarter of 1968 to one of less than 2.0 per cent in the fourth quarter of 1969.

The most notable economic adjustment in 1969, which has important implications for the performance of the economy in 1970, was the substantial moderation in consumer spending growth in the last half of the year as employment turned down, consumer credit tightened and prices increased. This marked slowdown in the growth of personal disposable income during 1969 is expected to continue into 1970 and should contribute to an even more cautious tone in consumer spending and borrowing. This trend represents one of the first clear signs that restraining budgetary policies at both the federal and provincial levels have begun to reduce inflationary expectations.



# Economic Aspects of Environmental Quality for Ontario

H. J. McGonigal, *Economist*

Department of Treasury and Economics

"One of the great challenges we face during the Nineteen Seventies is to restore (ecological) balance. The challenge to reduce and prevent pollution is, of course not that of Ontario alone. It is world-wide. But it is one to which the people of Ontario can make — indeed must make — a major contribution."<sup>1</sup>

Pollution in its widest aspects has become a universal concern of our society today. It seems certain that in the coming decade substantially greater individual and community efforts to defend the quality of our environment will be necessary. Discoveries are continuously being made of new and previously unrecognized biological perils which may be threatening man's survival. The analogy to primitive man, with his dependence on an inhospitable environment, may become uncomfortably accurate.

Today our communications media seek to inform us of both our own "local" pollution problems and the compounding related environmental problems which face other areas around the globe. Governments at all levels are seeking more effective remedial and preventive programs in pollution control. Universities and research institutions are mounting research programs on pollution. Individuals and private groups are taking the initiative in the area of environmental protection.

In future, the continuing emphasis by governments will have to be placed on education, research and the application of appropriate measures to control pollution in all its forms. The challenges of environmental protection in Ontario illustrate the complexity of biological and economic influences on our environment.

## THE PROBLEM

Environmental pollution is the condition of undesirable ecological change in the biological and aesthetic qualities of the air, water, soil and space around us. Changes in quality are occurring in such quantities and at such a rapid rate that neither neutralization nor accommodation by man and his beneficial biological associates is possible. The combined assault is producing a degradation of our environment which may become irreversible.

Today, pollution is caused by radioactivity, thermal, chemical and sonic conditions and material wastes including gases and refuse. These agents act on and in the mediums of soil, water and air — our surrounding land-

scape — and on its biological components, the combination of which makes up the environmental system of which we are a part. Pollutants produce conditions which tend to be physically damaging to the entire biosphere, including humans, and also tend to be aesthetically unpleasant.

## TECHNICAL FACTORS

### Water Pollution

The use of water bodies for the "natural assimilation of treated effluents in a properly controlled fashion" is recognized as a reasonable use, provided other beneficial uses are not adversely affected.<sup>2</sup>

The accumulation of undissipated or unneutralized wastes and their by-products in a body of water leads to pollution. The usual standards for measuring water quality include dissolved oxygen content, bacterial count, temperature, content of dissolved materials (toxic and nutrient), turbidity and chemical characteristics. There are also the important aesthetic considerations relating to appearance, smell and capacity for game fish. The precise definition of these standards is dependent upon the uses to be made of any water body.

There are three principal sources of water pollution in Ontario: municipal, industrial and agricultural wastes. Agricultural sources include animal wastes, eroded soil and the residues and run-off of fertilizers and pesticides. Controls are being developed in Ontario for most of these sources of agricultural pollution. The use of DDT and similar long-life insecticides was prohibited in 1969. The treatment of animal wastes is under study. Pollution from agricultural sources is generally less significant in terms of magnitude than are the other sources of water pollution in Ontario. However, the long-run effects of insecticide residues on a global scale may indeed be the most critical.

In terms of the organic waste load, municipal or household wastes represent only one-third of the volume of our industrial wastes. The majority of Ontario householders are connected to local sewer systems. These systems normally provide primary and secondary sewage treatment, which removes 85 per cent of the biological oxygen demand.<sup>3</sup> This degree of control has been achieved through the expenditure of \$1,211 million for municipal sewers and treatment facilities since 1957. It is estimated that a 95 per cent treatment level is the outside limit of present

technology and would "triple or quadruple operating costs".<sup>4</sup>

## Sewage Works Expenditures in Selected Years in Ontario

\$ millions

1957	80.1
1962	144.7
1967	151.5
1969	182.5
1970 <sup>1</sup>	170.0
Projection <sup>2</sup>	700.0

Source: Ontario Water Resources Commission  
<sup>1</sup>estimate

<sup>2</sup>total expansions and improvements currently planned or forecast

Problems still to be solved include the damaging effects of detergent phosphates on water bodies and the pollution of our recreational waters by the cottages which surround them.

Industrial wastes, often carried by our municipal sewage systems, are now the major source of water pollution. Waste discharges from Ontario's pulp and paper, mining and metallurgical, steel, food processing, petroleum and chemical industries are large sources of suspended solids, oxygen consumption and the chemical degradation of water.

Industries have themselves taken steps to deal with the problem. Since the establishment of the Ontario Water Resources Commission in 1957, \$143 million has been spent on facilities for the collection, treatment and disposal of industrial wastes. It is estimated that an additional \$150 to \$200 million for capital expenditures by industry is still required. In future, expenditures for pollution control equipment will become an integral part of all new industrial establishments, rather than being as they are now, a complex and costly addition to a plant's production technique.

A new and expanding source of pollution is the thermal electric generating station. These plants discharge cooling waters at temperatures sufficiently above those of the recipient water body to affect the aquatic environment. The concept of thermal pollution is new and, as yet, little understood. Research into the harmful and beneficial

<sup>1</sup>Province of Ontario, *Speech From the Throne, at the opening of the Third Session, Twenty-eighth Parliament, February 24, 1970.*

<sup>2</sup>The OWRC Regulatory Control Program for the Pulp and Paper Industry by H. A. Clarke and E. W. C. Turner, *Fifth Paper Industry Conference on Air and Stream Improvement, Toronto 1969.*

<sup>3</sup>The amount of dissolved oxygen used in the natural aerobic decomposition of a quantity of organic waste in a body of water.

<sup>4</sup>Toward a Social Report. U.S. Department of Health, Education and Welfare, 1969.



### Estimated Capital Expenditures by Major Industries for Industrial Waste Treatment, 1957-69

Industry Classification	Total Expenditures 1957 to 1969 Inclusive \$ thousands
Pulp & Paper	41,733
Mining & Metallurgical	27,473
Petroleum & Petrochemical	25,911
Basic Iron & Steel	15,691
Chemicals	12,609
Metal Working & Plating	8,865
Other	10,335
<b>TOTAL</b>	<b>142,617</b>

*The foregoing does not include money spent for pretreatment of industrial wastes prior to discharge to municipal facilities, or expenditure by industry in jointly financed industrial-municipal treatment works.*

*From 1965, expenditures have been computed from Commission certificates of approval and Division concurrences.*

*Prior to 1965, expenditures were compiled from data provided by industry.*

*Source: Ontario Water Resources Commission.*

influences of thermal power stations is continuing in Canada and the United States.

### Air Pollution

Air pollution is primarily a product of the combustion of fossil fuels. In the U.S., the operation of motor vehicles is the source of at least 50 per cent of all major air pollutants. Industrial sources account for approximately 18 per cent, while utilities and other energy conversion activities contribute 21 per cent. The usual classification is between mobile and stationary sources of pollution.

Air borne pollutants include: carbon monoxide the most important pollutant in terms of weight emitted into the atmosphere; oxides of nitrogen and hydrocarbons, elements which produce photochemical smog; sulfur dioxide, released by the burning of coal and oil; and particulate matter such as industrial ash and lead from auto exhausts.

Development of atmospheric quality goals or standards is still in its primary stage because of the lack of comprehensive scientific data. However, it is known that air pollution can cause physical damages such as corrosion and soiling; can contribute to sickness and disability; and can injure agricultural crops

and other vegetation. The severity of the effects depends on the concentration and duration of the pollutants in the atmosphere and the frequency with which exposure occurs. Concerning long-term effects, "the more distant future holds the ominous possibility of radical changes in climatic conditions".<sup>5</sup>

The total cost factor in air management programs for Ontario is currently unknown. It has been estimated by the Air Management Branch of the Department of Energy and Resources Management that the cost of preventing air pollution from the province's pulp mills alone will be approximately \$50 million. Restrictions on the maximum sulphur content of heavy fuel oils and coal used in Ontario will, if imposed, add to the private users' operating costs.

In the case of automobiles, present regulations to reduce gasoline evaporation and exhaust pollution emissions cost approximately \$6 to \$7 million in the current model year. If stiffer standards are found to be necessary, costs could increase from \$20 per vehicle to over \$100 per vehicle. The motor vehicle industry itself has announced plans to produce vehicles which will use unleaded gasoline. In a message to Congress, U.S. President Richard Nixon has stated that, "it is quite possible that by 1980 the increase in the sheer number of cars in densely populated areas will begin outrunning the technological limits of our capacity to reduce pollution from the internal combustion engine".<sup>6</sup>

### Pollution of the Land: Soil and Landscape

This form of pollution results from a variety of sources; pesticide residues in the soil, solid wastes including radioactive materials, and the degradation of landscape quality and scenic value. The harmful elements of noise, the poor quality of community planning and land use zoning and even the loss of outdoor recreational resources may be considered as part of this extensive type of pollution. Some aspects are now coming to be recognized as current or potential environmental problems. As yet little research has been done on such factors as noise pollution.

Solid wastes are increasing, both in variety and in volume. The tonnage of solid wastes for disposal in the U.S. is projected to increase 166 per cent in the period from 1966 to 1976. Ontario's solid wastes will probably grow as fast. In the past, the main constituents of solid wastes were organic; now our accoutrements of living and of refuse include

cans from durable alloys, glass bottles, "indestructible" plastic containers and packaging, scrapped cars and appliances, industrial wastes . . . ad nauseum.<sup>7</sup> In many instances, the accumulation of solid wastes is exhausting convenient land-fill sites in our urban areas. Pollution of the ground water systems is also present in land fill operation. Similarly, incineration of the wastes can contribute to air pollution.

The waste management programs to be undertaken by the U.S. government are directed toward two major goals which would be appropriate for Ontario:

- 1) Making products more easily disposable — especially containers, which are designed for disposal.
- 2) Re-using and recycling a far greater proportion of waste materials. In the long-range future recycling of materials will become increasingly necessary not only for waste disposal but also to conserve resources.<sup>8</sup>

Air pollution was brought under provincial jurisdiction in 1967. It is now expected that in the near future the provincial government will assume responsibility for the control of waste disposal in Ontario. The program might regulate the number and location of private waste dumps and control the types of waste which could be disposed of in various classes of dumps.

The annual costs of solid wastes treatment in Ontario are currently running at \$90 million. These expenditures are estimated to climb to \$250 million by 1980. More than 50 per cent of the expenditures will be made for the disposal of industrial wastes. In terms of individual consumption and waste production, a possible financing technique would be to include in the price of an object the cost of its eventual disposal by the community.

How are we to deal with the waste products of all our activities; industry, commerce, agriculture and domestic living? In the past, economic theory has tended to be concerned with services yielding utilities, not with physical substances. The "final consumption" of our manufactured products does not in fact reduce the size of the residual load on the environment. The physical concept of a "materials flow" and the law of conservation of matter must be recognized. The amount of output deposited in the natural environment must equal the amount of fuels, food and other raw materials that enter the processing systems. While most of the waste products can still be assimilated with little

<sup>5</sup>Ibid.

<sup>6</sup>Message by President Richard Nixon to the Congress of the United States of America, on a Comprehensive Pollution Program, February 10, 1970.

<sup>7</sup>A representative of the plastics industry has forecast that plastic refuse in Canada will increase from 300 million pounds in 1966 to 600 million pounds by 1975.

<sup>8</sup>President Richard M. Nixon: *op.cit*



damage to our environment, the remainder is causing concern.<sup>9</sup>

The accompanying chart shows the physical flow of materials in our system — from primary products through energy conversion and materials processing to final consumption, waste production and residuals processing. Each stage in the cycle results in the escape of by-products and residuals into the environment. The diversity of both the sources and types of waste products is illustrated by the numerous outward flows from the processing and consumption stages. Our objective is to achieve in the future a greater return of the outward flows to the processing-consumption system, as useful raw materials and recoverable or recycled resources, with fewer residuals released to damage the environment.

### ECONOMIC FACTORS

The complex phenomenon of pollution extends far beyond local jurisdictions in terms of both cause and effect. The problems of pollu-

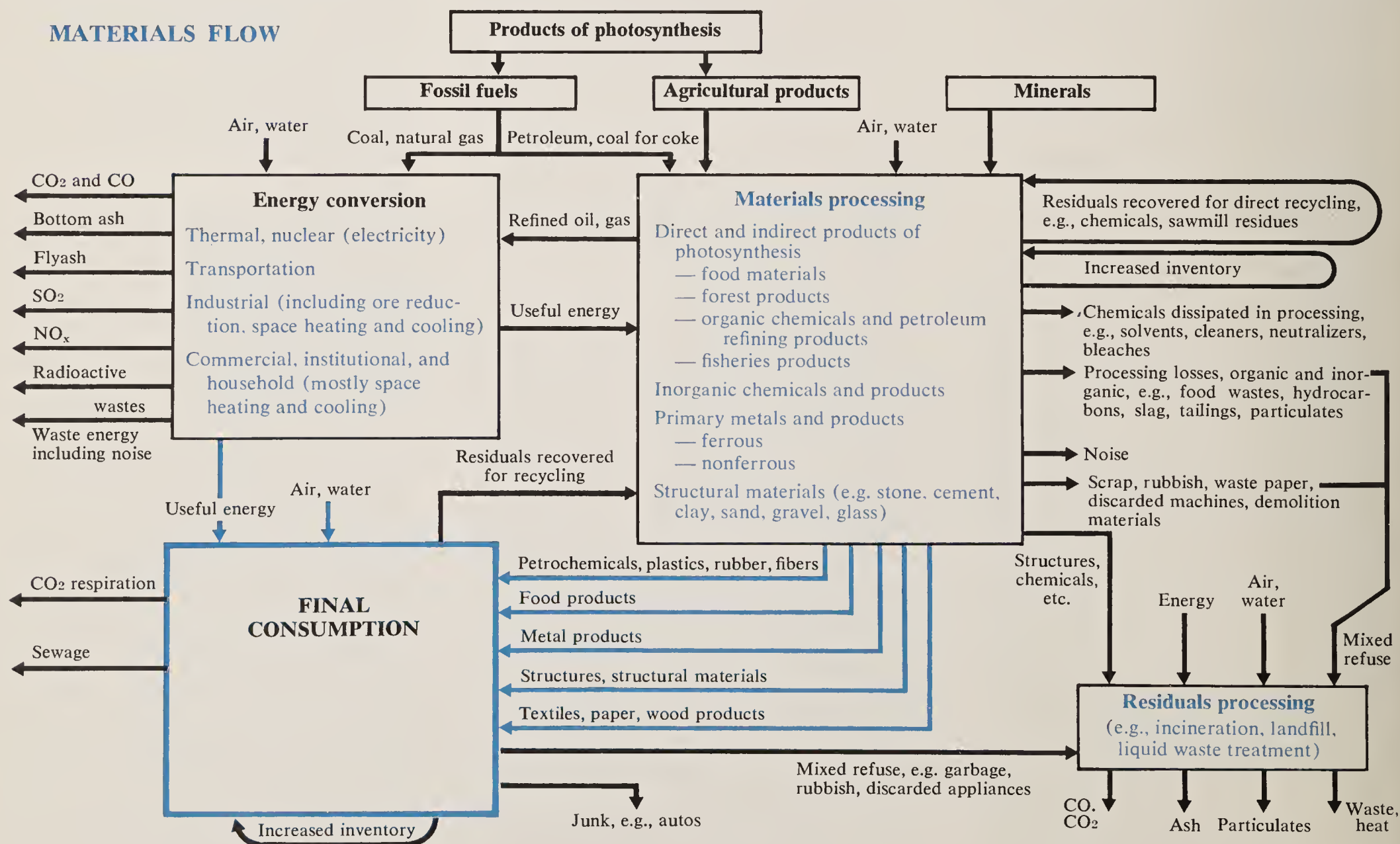
tion are now being recognized throughout Canada and indeed, throughout all advanced industrial countries of the world.

### Underlying Causes

The causes of pollution are intimately inter-related with the goals and activities of advanced societies. The rapid rate of physical progress and the growth of Ontario's population have contributed to our pollution problems. Demands for more new and better goods and services have increased the problem. Similarly, the concentration of population and industry in our major urban areas is a significant contributing factor to the deterioration of our environment. An increasing awareness of our surroundings and a growing demand for improved quality in all things have also served to emphasize the damages caused by pollution.

The desire for economic growth results jointly in greater affluence, and through the industrial sources of wealth, more effluents. Our demands for greater convenience, greater

processing and greater sterility in the goods we consume all include an element of pollution. In order to satisfy these demands, our economy generates new technologies resulting in new products, new materials, more packaging and concurrently, more wastes and new and difficult waste disposal problems. Fertilizers and pesticides which are used to help meet our agricultural requirements contribute to undesirable conditions in the soil and in the rivers and lakes. The search for convenient transportation techniques and recreational opportunities, may often be both self-defeating and damaging to the environment. The ubiquitous car is recognized as a significant contributor to noise and air pollution in urban areas. Snowmobiles, motorboats and aircraft can all have a negative effect on the outdoor environment. The list of contradictory situations — where social costs as well as individual or social benefits are incurred — in our society seems endless. The universal aspect of pollution as it is interwoven with the laudatory objectives of



Source: Resources for the Future, Inc. Annual Report, 1969

<sup>9</sup>See also Pervasive External Costs and the Response of Society, A. V. Kneese and R. C. d'Arge, Resources for the Future, Inc., 1969.



our society must not be overlooked when solutions are being sought.

### A Public Good

The complex nature of environmental protection results in part from the fact that the environment is a public good — as opposed to a private good that is capable of divisibility and private ownership. Pollution caused by an individual damages the environment for all society while producing short-term private benefits to the polluter. The rest of society is not compensated for the damage that the polluting activity inflicts on the environment. The polluter's private costs are less than the full social costs of his action. The result of this discrepancy between the private and social costs is an excess, in economic welfare terms, of production by the polluter.

In the past, the individual has not always been held responsible for the social costs of his polluting actions. He, therefore, has had little incentive to reduce the damaging effect of his actions on the environment. "Quite inadvertently, by ignoring environmental costs we have given an economic advantage to the careless polluter over his more conscientious rival. While adopting laws prohibiting injury to person or property, we have freely allowed injury to our shared surroundings."<sup>10</sup> Because of the public nature of the environment, governments must act for society both to eliminate injurious pollution conditions and to recover from the individual polluter adequate compensation to cover the social costs of his damage to the environment.

There is however, a separate problem inherent in the allocation of social costs. The cause and effect relationship between an individual activity and its increment to environmental pollution levels and social costs is often remote and not easily observed or evaluated. In most cases each separate act of pollution by an individual or an industrial establishment causes an imperceptible increase in environmental degradation. Only when the minute changes from many individual activities accumulate does the damage become observable. At this point it is extremely difficult to determine the portion of the total social costs attributable to each individual pollution source. Therefore, in lieu of effective measurement techniques for the resulting social costs of environmental pollution, the treatment costs of pollution, expressed in monetary terms, must be substituted.

Treatment costs in Ontario in the field of

water pollution control alone have reached in excess of \$1.3 billion since 1957. Public and private expenditures in 1969 for comprehensive water management and pollution control programs were approximately one quarter of a billion dollars, including \$200 million spent by the municipalities for water supply and sewage treatment facilities. Private capital expenditures of \$15 million for industrial waste treatment facilities are also included in the 1969 total. To date, the direct treatment costs for solid wastes and air pollution control are of a substantially lower order. However, future expenditures in these areas are expected to grow particularly rapidly.

### Economies of Scale

In some cases economies of scale in treatment programs can be achieved where a multitude of individual polluters are contributing to environmental damage. It is much more efficient in water treatment, sewage or waste management programs to install community facilities rather than requiring each polluter to conduct his own separate program.

The concept of scale forms the basis for the large public water supply and sewage treatment schemes being developed in Ontario. Twenty-five regional schemes were under active development at the end of 1969. In 1968, the largest scheme to date involved the OWRC and five Peel County municipalities. The objective is to develop an extensive water supply and sewage system at a cost of \$88 million over the next twenty years. Ownership of the provincially financed schemes remains vested with the province. The participating municipalities pay for the water supply and sewage treatment services based on the actual cost to the provincial government.

### Externalities

There are some additional economic considerations related to the public nature of our environment. Due to the complex nature of different components in the environment, both pollution acts and control activities have external implications beyond local jurisdictional boundaries. Thus, either damages or benefits can occur as "spill-overs" to communities beyond the local area where the polluting act or control activity occurs.

At the local level, a farm's well water may become degraded as a result of ground-water pollution resulting from neighbouring activities. The "spill-over" problem can arise unexpectedly from industrial or sanitary land

fill projects which pollute local ground-water supplies, as well as from salts and petroleum products which enter a ground water system. Investigation and control of ground-water pollution is a responsibility of the Division of Water Resources of the OWRC.

A similar externality arises when unpleasant odours from an agricultural operation cause discomfort to neighbouring residents. A code regarding air pollution and odour problems has been proposed by the Ontario government under the Ontario Air Pollution Control Act to provide guidelines for agricultural operations in proximity to residential areas.

In terms of benefit "spill-overs", a downstream user of a river will receive some benefits, in terms of reduced treatment costs or a larger and cleaner water supply, as a result of water management and pollution control programs of upstream municipalities.

The international nature of pollution control is exemplified by the current report by the International Joint Commission on pollution in Lakes Erie and Ontario and the international section of the St. Lawrence River.<sup>11</sup>

The recommendations of the IJC include:

- 1) Adoption for these waters of water quality objectives appropriate to the area;
- 2) Acceleration as necessary of the pollution control program of the several state and provincial agencies concerned, in order to meet the recommended water quality objectives at the earliest possible dates;
- 3) Maintenance of adequate water quality surveillance and monitoring activities to allow for assessment of and adjustments to water pollution programs of enforcement, management, planning and research; and a continuing board to co-ordinate on an international basis, programs for water pollution control of the Great Lakes; and
- 4) A phosphorous control program effecting an immediate reduction in the phosphorous content of detergents to minimum practical levels, and by 1972, complete replacement of the phosphorous compounds by substitutes less harmful to the environment. An 80 per cent reduction of phosphorous complexes in municipal and industrial waste effluents discharged to Lake Erie and the Detroit River would be required by 1972, and a similar reduction in discharges to Lake Ontario by 1975.<sup>12</sup>

Following recent federal-provincial discussions, the Government of Canada is now

<sup>10</sup>President Richard M. Nixon: *op.cit*

<sup>11</sup>The International Joint Commission is a joint U.S.-Canada governmental body set up 60 years ago to deal with problems affecting boundary issues of the two countries. Investiga-

tions into the international pollution problems of the Great Lakes and their connecting channels were carried out by the Ontario Water Resources Commission for the information of the IJC.

<sup>12</sup>As reported by the Federal government in Fisheries of Canada, November, 1969.



investigating the most effective means of achieving control within a reasonable timetable. It has been estimated that municipal water treatment costs would increase by 100 per cent, if the phosphate content of detergents were not reduced.<sup>13</sup> The cost of additional phosphate removal equipment needed to reach the IJC objective could be \$40 million for Ontario communities on the Great Lakes.

Under the Canada Water Bill, the Federal government is currently developing a formal legislative statement of its future role in water management and pollution control in Canada. After receiving second reading early this year, the bill is now being amended following discussions with a number of provincial governments. Measures to control the level of phosphates reaching the Great Lakes will be implemented under this bill.

Again, the existence of externalities, particularly from water and air pollution by local communities, has made it necessary for the Government of Ontario to undertake responsibility for pollution control within the province. Ontario is able to internalize the spill-overs from the different communities within the province and to assign benefits and costs equitably among the entire population. Because of the existence of externalities beyond Ontario boundaries — environmental damages can and do occur as a result of activities taking place outside of provincial jurisdiction — there is a role for the Federal government within its constitutional jurisdiction in inter-provincial and international situations concerning pollution acts which affect the Ontario environment.

### ESTABLISHMENT OF PLANNING OBJECTIVES

A first step toward the solution to the complex problems facing our environment is the establishment of planning objectives. The objective must be to establish a dynamic and flexible system which will protect the quality of our environment against ever-changing pollution threats. The three inter-dependent components of such a system are control, prevention and improvement.

As an immediate objective, the current levels and types of pollution should not increase in intensity despite our growing economy. This is the control element of the system. The specific pollution problems which we can recognize today, must be brought under control and held to acceptable levels by such methods as exhaust reduction

devices on all new autos sold in Ontario, sewage holding tanks on pleasure craft, or very recently, the promised federal commitment to effect a reduction in phosphate content of detergents.

Concurrently, we must also seek effective measures to prevent new and different forms of pollution damage. For example, we might have recognized more fully and more quickly the potential for environmental damage inherent in the increasing use of DDT, or less critically, in the introduction of non-returnable glass bottles, and avoided some of the damages. Some pollution problems are more effectively overcome by avoidance and prevention rather than treatment after the damage is done. Environmental specialists suggest that the introduction of the new jumbo and supersonic jets, with their attendant exhaust and noise problems, will lead to a situation where some form of preventive action is required.

In future, the primary emphasis in our environmental quality system will have to be placed on prevention. In terms of economic efficiency and human survival, the recognition and prevention of potentially disastrous damages to the environment must be consistently sought by all governments. Similarly, the private sector will have to investigate more carefully the environmental side-effects of each new product and process.

The third component of an environmental defence system is improvement. The objective is more than simply maintenance of the present environmental quality. We can move forward with programs to improve our whole environment. The control of pollution and prevention of new damages must, in the longer run, be supplemented by a dedication to bring all forms of pollution to irreducible minimums through the best use of our physical resources.

In striving for these objectives for the environment, the constraints imposed by our economy cannot be overlooked. Ontario has, in both the public and private sectors, a limited amount of funds for carrying out all its responsibilities, including pollution control programs. Within the constraints of our economic capabilities, Ontario's various objectives must each be furthered as much as possible. Conflicts can occur between objectives, as they do between the proponents of ultimate environmental quality at all costs versus those who seek economic growth at all costs. Government must determine the trade-offs which are necessary between conflicting

goals, giving due regard to the social benefits and costs of each activity. If Ontario has achieved a greater expertise in pollution control than other areas in Canada, it reflects both greater economic capabilities to deal with the problem and, as a by-product of our economy, greater pollution problems.

### GUIDELINES FOR PUBLIC POLICY

There are several basic guidelines about which policies for environmental quality can be built. Two of the guidelines relate to long-term objectives for Ontario. The fundamental principle of efficient use of our physical resources, in the sense of a broad ecological system, must result in minimizing waste and unusable products in our environment. Associated with this principle is the recognition of our environment as a resource. The concept of a closed system — "the spaceship earth" — will minimize pollution and environmental damage while maximizing the utility of all our resources. The previous objective of prevention of new pollutions is an expression of this guideline.

A second basic principle for the long-term is the minimum use of the natural environment for waste dispersal or disposal. While this principle must be recognized as only a theoretical concept in the light of present technology, it can serve as a guide for the continuing improvement of pollution control activities. Thus, a city's sewage and water treatment facilities would serve as much as possible as a closed system — not, in fact, utilizing more than necessary the neighbouring river or lake as part of the local purification system. Similarly, the atmosphere would not be considered as an extension of the factory's smoke stack.

There are two economic guidelines which must shape all pollution control policies: user and polluter charges. All users of the components of the public environment — atmosphere, soil, water and the landscape — must pay the unassigned public costs of quality control, just as each community must bear the social costs incurred in its own environmental degradation. These costs for clean water and clean air must be borne through public tax levies by all the individuals living in and benefiting from their protected environment. Conversely, outside jurisdictions which do not derive benefits through spill-over effects cannot be assigned, on economic grounds, a share of the costs.

The second economic guideline is that the polluter must bear either the cost of pollution

<sup>13</sup>Testimony to the IJC on February 21, 1970 by the sewage disposal commissioner of Toledo, Ohio.



abatement expenditures incurred to maintain environmental quality or compensate fully for the cost of the resulting damage.<sup>14</sup> The actual damage to the environment represents social losses which often cannot be accurately defined in monetary terms. Financial penalties must be used as a surrogate for these unknown social losses. Penalties also encourage the polluter to reconsider the economics of his own polluting activities.

## ROLE OF GOVERNMENT

The responsibilities of government in pollution control are two-fold: to ensure the protection of the environment as a critically limited public resource; and to inform and educate the individual to recognize his responsibility and his own vital interest in pollution abatement. Governments can also offer advice and assistance to the individual in the complex and costly area of pollution control.

Governments must also undertake systematic planning on a comprehensive, inter-jurisdictional basis in order to protect our environment. Public objectives must be clarified and effective programs devised, financed, and implemented. Minimum and desirable quality standards for air, water and the landscape are required. The degree of deviation from these standards permits the assignment of priorities. Program priorities can be set within the parameters of general environmental objectives, regional and local objectives and individual problem situations. Continuous monitoring and quality assessment are necessary in order to achieve the desired quality standards. Governments must ensure an equitable distribution of costs of pollution control measures based upon the public and private share of all benefits and all costs. Another extremely significant role of government is that of research. An expanded program of research into the current and predictable pollution problems affecting the environment and into a search for solutions to these problems is urgently needed on a national and international scale.

The provincial government has the broad responsibility for pollution control and environmental defence within its own jurisdiction. Ontario has on-going programs in the areas of research, solid wastes management, comprehensive water resource management, atmospheric pollution control, restrictions on chemical pollutants such as DDT, and other environmental health concerns.

The Department of Energy and Resources

Management is primarily responsible for our program of environmental management and pollution abatement. That department contains: the *Advisory Committee on Pollution Control*, the senior advisory body on pollution; the *Air Management Branch* concerned with maintenance of urban air quality and abatement of air pollution; the *Waste Management Branch*, providing assistance to municipalities on the technical problems of solid waste disposal; and the *Conservation Authorities Branch*, concerned with conservation and comprehensive environmental management on a river valley basis, through local municipal governments. This latter program includes water management and flood control projects. The program of the agency was initiated in 1946 with the passing of the *Conservation Authorities Act*.

The Minister of Energy and Resources Management, the Hon. G. A. Kerr, also has reporting to him the *Ontario Water Resources Commission*, whose primary concern is the control of water pollution, the provision of adequate supplies of water and the supervision of all surface and ground-waters throughout Ontario. The Commission has established water quality guidelines for Ontario waters.

Formed in 1956, the functions of the OWRC include: inventories of water resources, monitoring of water quality, approval of plans of water and waste treatment projects, inspection of facilities, investigation of sources of pollution, financial and other assistance for the construction and operation of water and sewage plants in municipalities, biological, bacteriological and chemical studies, and public information. Control of pollution by pleasure boats is another responsibility of the Commission.

The *Environmental Health Services Branch* of the Department of Health is also concerned with aspects of environmental protection. The *Pesticides Advisory Board* serves all departments concerned with pesticides.<sup>15</sup> As noted previously, the general use of certain pesticides, including DDT, was banned in Ontario in 1969.

The government of Canada also has a role to fulfil in environmental quality control. There is an opportunity for the Federal government to participate with the provinces in offsetting some of the public costs of pollution control. There is also a requirement for expanded federal financial encouragement to the private sector to undertake pollution abatement measures. Inter-government co-

operation is necessary in respect of joint programs involving tax abatements, grants, loans or other incentives.

Extensive federal involvement is needed in environmental research in conjunction with research programs in Ontario. The research requirement is both substantial in size and international in scope. The federal research program could concentrate on longer term research projects and advance warning systems to identify and avoid potential environmental dangers.

There is a third general area in which a federal commitment is appropriate. Inter-jurisdictional and regional environmental problems merit federal participation within its constitutional jurisdiction. As water pollution is a widespread current problem, remedial programs at the national as well as provincial levels will be useful. The proposed Canada Water Act can provide a vehicle for federal participation in the establishment of common water quality criteria and in international situations.

It must be ensured that no agency or region employs unrealistically low environmental quality standards which will result in damaging "spill-overs" or which will create an undue advantage over other jurisdictions for the attraction of industry.

## CONCLUSION

Environmental pollution is a dynamic problem with ever-changing parameters. In order to protect the quality of our environment — to manage the environment effectively — continuing investigation is required into different approaches and techniques. New and improved institutional and interjurisdictional arrangements must continue to be sought. All levels of government must also ensure that the problems of fragmented responsibility for our environment are not further compounded through duplication of effort and bureaucratic complexity. Co-ordinated and comprehensive planning is essential.

Further analysis of environmental questions in terms of public goods and social welfare concepts are needed. The problems of equitably allocating the costs of environmental protection between individuals, industries and the public sector are not yet solved. It is also necessary that we fully realize that our commonly held objective of maximizing economic growth holds unpleasant implications for the quality of the environment and indirectly, for ourselves.

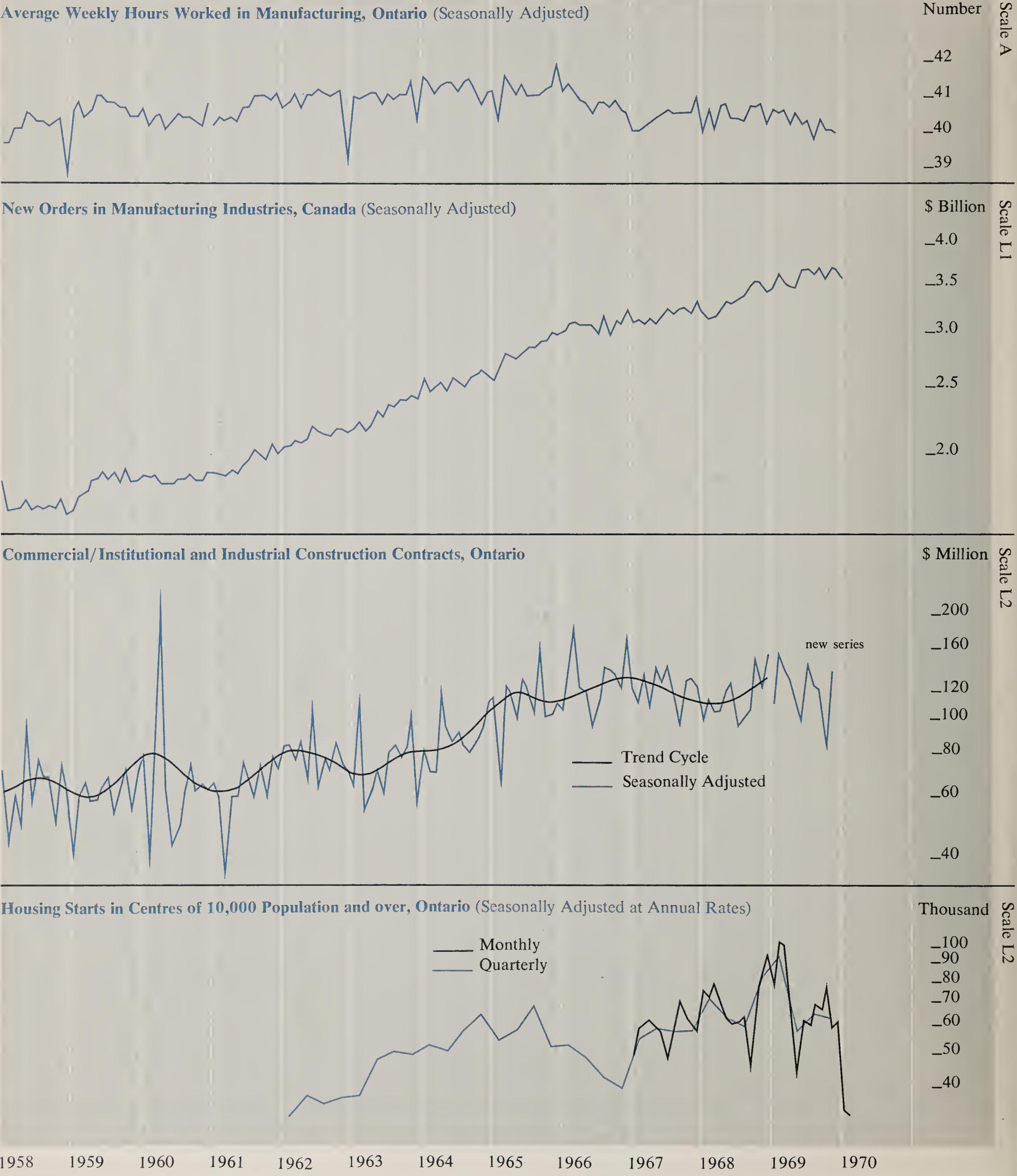
<sup>14</sup>See also *Pollution, Property and Prices*, J. D. Dales, University of Toronto Press, 1968.

<sup>15</sup>These services are expected to be transferred to the Department of Energy and Resources Management in the near future.



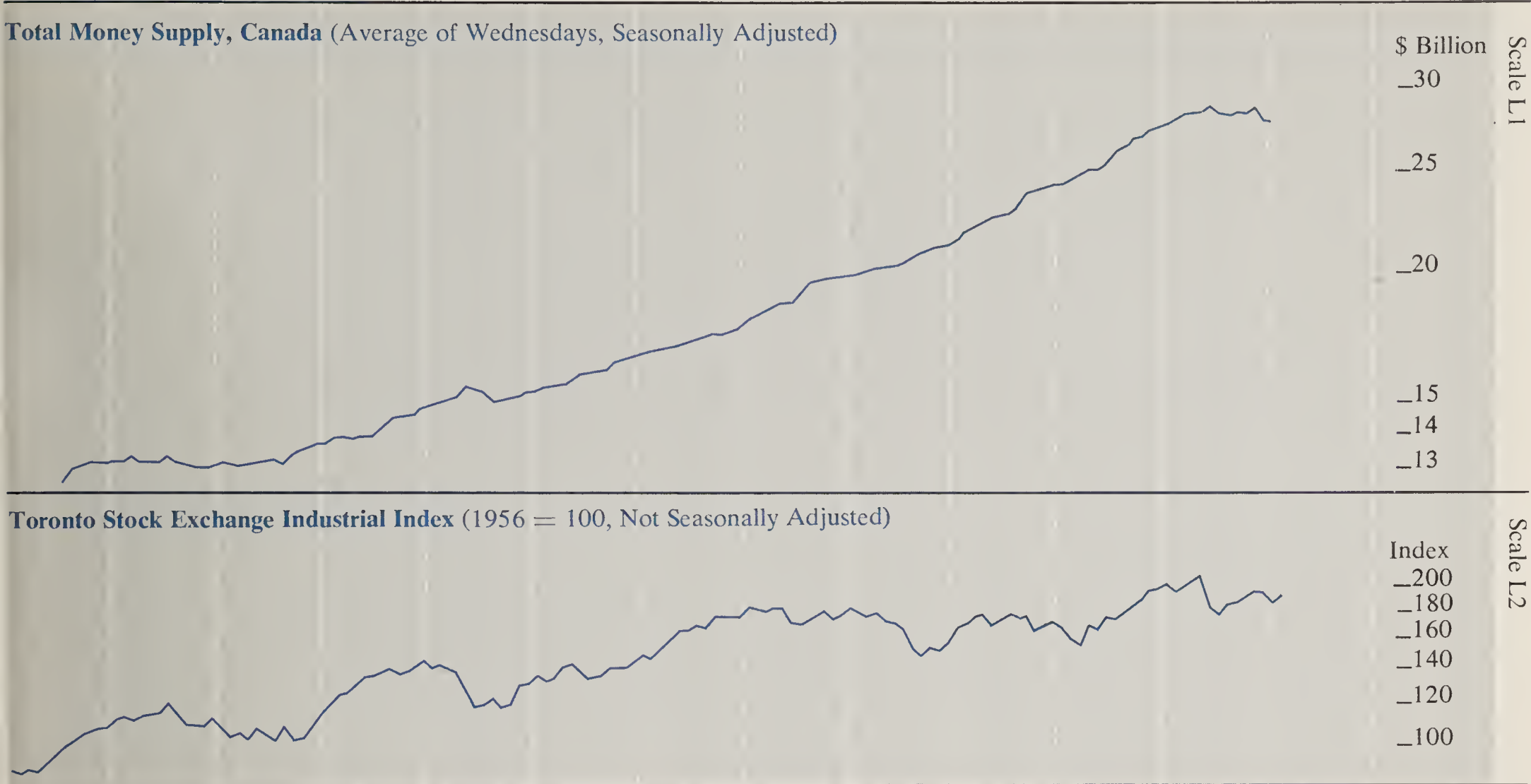
# Selected Economic Indicators

## Leading Indicators

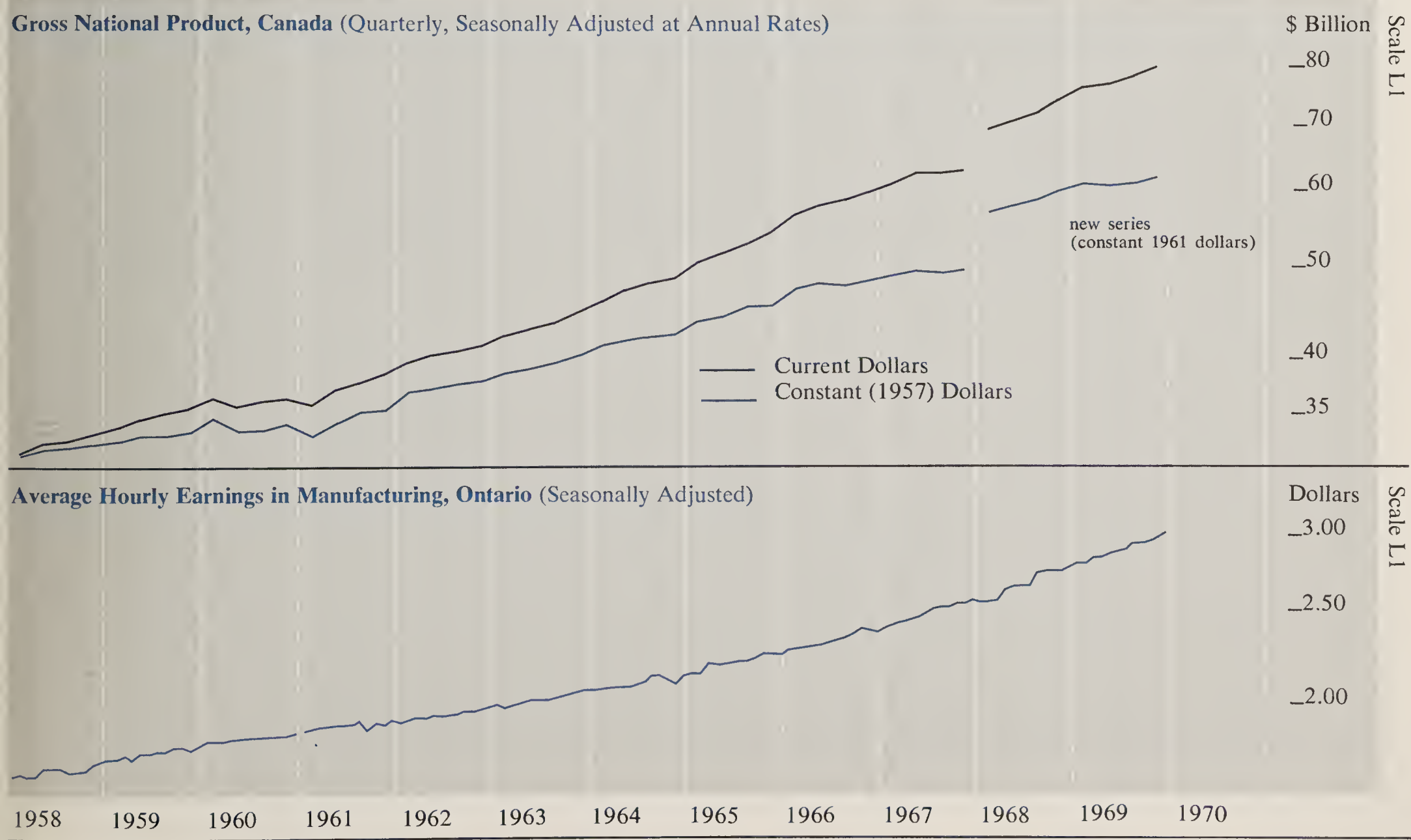




# Leading Indicators

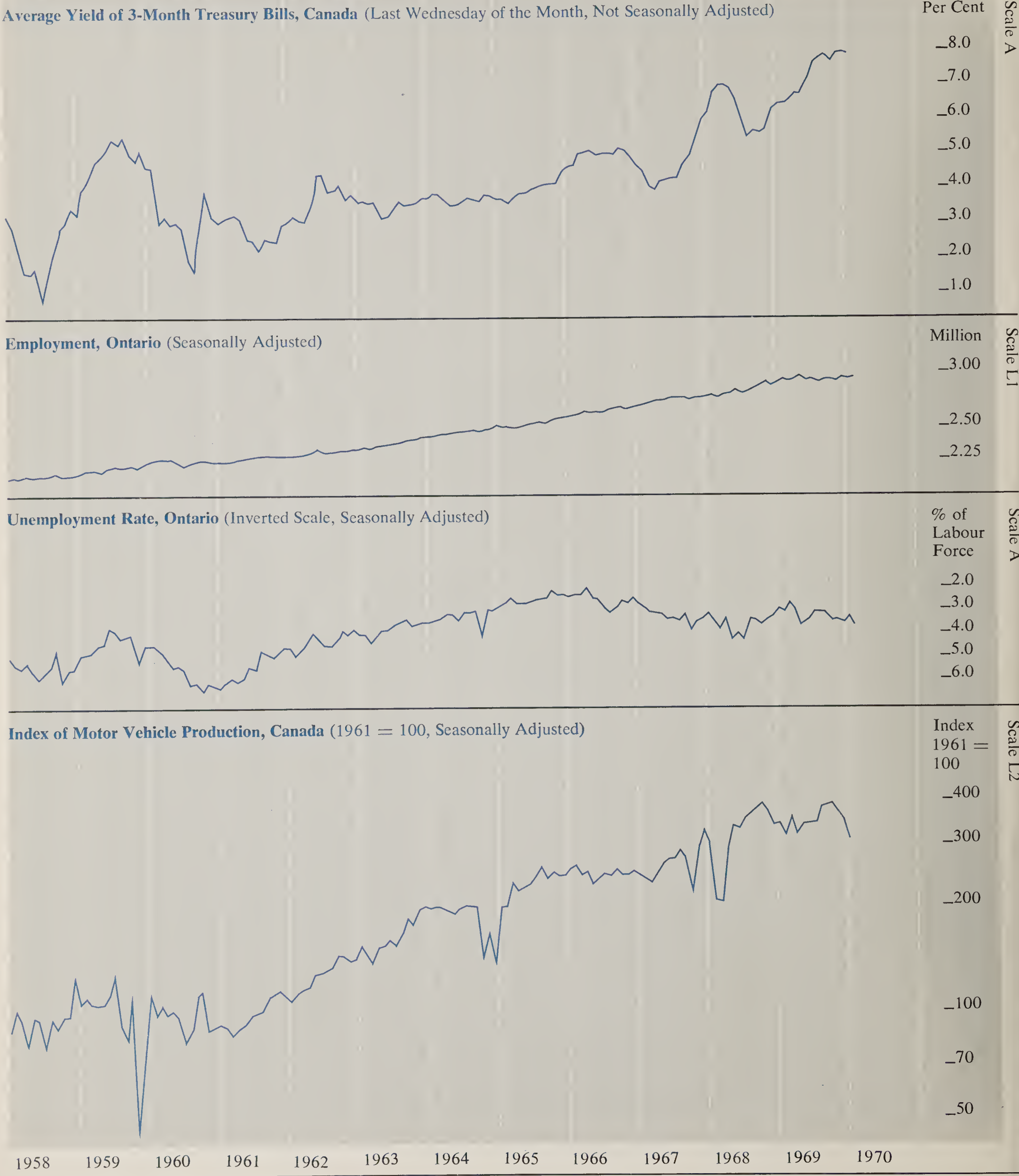


# Coincidental and Lagging Indicators





# Coincidental and Lagging Indicators





# Economic Indicators

Seasonally Adjusted

HA/14/17.0636  
Ontario. Dept. of Economics and  
Ontario economic review

Mar/Apr  
gmwg

1970  
BAS

c.1

1969

1970

## Leading Indicators

Average Weekly Hours Worked in Manufacturing	40.5	40.4	40.5	40.1	40.4	40.2	39.6	40.3	39.9	39.9	38.4	
New Orders in Manufacturing Industries <sup>c</sup>	3,518	3,693	3,575	3,539	3,564	3,743	3,690	3,770	3,634	3,754	3,728	3,609
Commercial/Institutional and Industrial Construction Contracts	111.9	157.9	140.6	126.1	112.8	93.9	144.0	123.2	86.6	137.3		
Urban Housing Starts (Annual Rate)	80,800	109,700	102,400	79,900	45,300	63,900	60,800	67,300	78,300	59,100	64,700	34,800
Money Supply <sup>c</sup>	27,669	27,927	28,251	28,331	28,336	28,638	28,324	28,292	28,472	28,580	27,718	27,692
T.S.E. Industrial Index <sup>u</sup>	192.47	185.20	190.58	195.31	197.23	177.34	168.65	175.43	178.15	182.11	187.65	186.37
Business Failures <sup>u</sup>	57	59	55	58	48	35	32	51	52	64	54	56
Business Failures — Liabilities <sup>u</sup>	2.9	3.2	2.2	3.2	1.9	2.0	0.9	2.6	4.8	3.4	2.2	9.9
												18.7

## Coincidental and Lagging Indicators

Gross National Product <sup>c</sup> (Annual Rate)			76,492			76,968		78,684			80,252	
Average Hourly Earnings in Manufacturing	2.84	2.84	2.88	2.89	2.92	2.93	2.94	2.97	2.99	3.02	3.06	
3-Month Treasury Bill Rate <sup>c,u</sup>	6.38	6.43	6.58	6.80	6.74	7.13	7.62	7.69	7.77	7.76	7.81	7.78
Cheques Cashed in Clearing Centres <sup>1</sup>	5,820	6,032	6,428	6,243	6,066	6,152	6,458	6,560	6,570	6,526	6,240	6,078
Retail Trade	879	886	862	866	866	875	884	886	901	892	909	891
Labour Force	3,010	3,037	3,019	3,038	3,071	3,035	3,028	3,004	3,027	3,035	3,064	3,044
Employed	2,928	2,947	2,940	2,948	2,958	2,926	2,935	2,910	2,932	2,930	2,957	2,948
Unemployed	82	90	79	90	113	109	93	94	95	105	107	96
Unemployed as % of Labour Force	2.7	3.0	2.6	3.0	3.7	3.6	3.1	3.1	3.1	3.4	3.5	3.2
Wages and Salaries	1,239	1,256	1,264	1,271	1,288	1,295	1,318	1,303	1,312	1,318	1,347	
Index of Industrial Employment	130.5	131.2	131.5	131.4	131.4	131.0	129.6	129.3	129.6	130.7	132.8	132.3

Index of Industrial Production <sup>c</sup>	165.8	168.0	171.3	167.7	167.0	167.1	166.8	164.5	165.9	165.6	169.3	172.0	170.7	174.6
Total Manufacturing <sup>c</sup>	164.2	167.5	171.3	167.3	168.5	169.0	169.3	166.5	166.8	166.7	169.5	170.7	167.7	170.8
Non-Durables <sup>c</sup>	147.6	150.8	153.6	150.2	150.6	151.1	151.6	152.5	153.0	152.4	153.4	154.3	151.8	154.3
Durables <sup>c</sup>	184.5	187.8	193.0	188.2	190.3	190.8	191.0	183.7	183.8	184.1	189.2	190.7	187.3	191.0
Mining <sup>c</sup>	159.7	160.6	162.1	155.7	145.5	142.6	138.9	136.2	141.8	140.3	151.8	163.4	168.1	177.8
Electric Power and Gas Utilities <sup>c</sup>	189.5	184.3	184.7	186.2	186.1	187.1	189.0	190.1	194.6	195.5	194.6	197.0	201.0	203.0
Primary Energy Demand (Annual Rate)	59.83	58.45	59.49	59.20	58.54	59.12	60.28	58.83	58.39	59.09	59.56	63.13	64.53	63.91
Exports (including re-exports) <sup>c</sup>	1,204.8	1,243.8	1,295.7	1,194.2	1,233.6	1,212.5	1,196.0	1,161.7	1,293.4	1,283.0	1,285.0	1,312.9	1,457.3	1,403.7
Imports <sup>c</sup>	1,149.0	1,194.2	1,178.3	1,149.3	1,166.6	1,215.2	1,124.2	1,136.3	1,220.1	1,206.7	1,223.2	1,214.0	1,118.0	1,227.8

## Unclassified Indicators

Foreign Exchange Reserves <sup>c,u</sup>	2,864	2,820	2,779	2,782	2,760	2,623	2,565	2,594	2,539	2,629	2,613	2,616	2,798	
Industrial Materials Price Index <sup>c,u</sup>	261.4	263.5	264.1	267.7	271.8	270.6	270.5	269.2	270.4	266.8	267.8	271.5	272.3	274.3
Consumer Price Index <sup>c,u</sup>	122.6	122.6	123.2	124.6	124.9	125.9	126.4	126.9	126.6	126.8	127.4	127.9	128.2	128.7

<sup>c</sup>Statistics for Canada.

<sup>u</sup>Not seasonally adjusted.

<sup>1</sup>Ontario less Toronto.









# Ontario Economic Review

---

**May/June 1970**  
**Volume 8, Number 3**

**Department of Treasury and Economics**

**Hon. Charles S. MacNaughton, Treasurer of Ontario  
and Minister of Economics**

**H. Ian Macdonald, Deputy Minister**

---

HA  
747  
.0656

1970  
May/Jun  
c.1 BAS



# Ontario Economic Review

May/June 1970

Volume 8, Number 3

## The Ontario Economy

1

## The Public Sector and Economic Policy

3

Taxation and Fiscal Policy Branch,  
Department of Treasury and Economics

## Selected Economic Indicators

9

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. Charles S. MacNaughton  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

### About the Review

The feature article for the May-June edition of the *Ontario Economic Review* is based on Budget Paper A, The Public Sector and Economic Policy, contained in the 1970 Annual Budget Statement of the Hon. Charles MacNaughton, Treasurer of Ontario and Minister of Economics.

The article is presented by the Ontario Government as a first step toward stimulating a broader and more intensive inquiry into the theory and practice of economic policy co-ordination in the Canadian federal system. Specifically, the article concentrates on the question of the formation of public policies to reduce inflation and to achieve full employment growth and balanced development of the public and private sectors of Canada's diversified economy. The Ontario Government questions the effectiveness of present federal programs to control inflation and suggests that economic growth will be sacrificed if governments continue to apply severe monetary and fiscal restraints.

The article was prepared under the direction of Dr. T. M. Russell in the Taxation and Fiscal Policy Branch, Policy Planning Division of the Department of Treasury and Economics.

### Indicator Charts, Pages 9-11

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 9-11 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



# The Ontario Economy

## Private and Public Investment — 1970

New private and public capital spending in Ontario is expected to increase approximately 14.0 per cent this year to \$7.1 billion, with spending on housing the only weak spot according to the federal Department of Industry, Trade and Commerce. Actual spending on housing is expected to decrease by 10.7 per cent to \$1,275.4 million in 1970.

Increasing strongly in spite of federal efforts to curb the pace of the Ontario economy, it is anticipated that capital investment will advance at nearly double the national rate. Construction in trade, finance and commercial services is expected to increase by approximately 55.0 per cent this year despite federal budgetary intentions to discourage commercial construction in Ontario urban centres by extending the deferral of depreciation allowances into 1970. Commercial construction alone should amount to \$451.8 million compared with \$291.1 million in 1969.

Estimated total capital expenditures in Ontario for 1970 are shown in the table below.

The survey finds the greatest strength in manufacturing industries, where a 41.1 per cent increase in capital spending to \$1,762.0 million is anticipated. In 1969 capital expenditures in this category rose 24.8 per cent. At the national level capital outlays in manufacturing industries are expected to increase by 24.0 per cent to \$3,154 million following a 15.7 per cent increase last year. Since the major goods-producing industries are largely concentrated in Ontario it is not surprising that this province is expected to outperform the national average in the manufacturing sector. In addition, many of the investment intentions of 1969, unrealized due to strikes

and tight monetary constraints, have been carried forward to 1970, hence a somewhat higher growth rate is expected in business investment. Intended outlays are particularly high in the primary metal, machinery, transportation equipment, paper and allied products and petroleum and coal products industries.

It is anticipated that the marked industrial expansion forecast by the report will improve productivity and manufacturing efficiency and thus provide some relief to rising production costs. In addition, the expansion should also offset to some extent the adverse effects on employment of a general deceleration of economic activities visible in the second quarter of 1970.

At the national level private and public sectors are expected to spend \$17,865 million for fixed assets in 1970, \$1.25 billion or 7.5 per cent in excess of actual expenditures in 1969. The annual capital spending intentions outlook, based on surveys carried out late in 1969 and early in 1970, indicates the overall rate of increase will be about the same as in 1969, however it will represent a rising level of activity in terms of volume. These increases follow two years when capital outlays rose only marginally in terms of value and in which the volume of such activity actually declined.

Outlays for new construction in Canada are expected to rise 7.0 per cent to \$11.44 billion while outlays for new machinery and equipment are expected to rise just over 8.0 per cent to \$6.43 billion. Including repair expenditures, total private and public outlays on construction, machinery and equipment are expected to total \$23.3 billion this year. As in Ontario, the main impetus behind capital spending growth this year will

come from the business sector which is expected to increase expenditures 11.0 per cent to \$10.9 billion. This is a reduction from the 14.0 per cent increase indicated by the preliminary survey last fall of 150 large companies.

Spending on new housing and social capital spending by governments and institutions will reach \$6.9 billion. However, while government and institutional expenditure is expected to increase by approximately 10.0 per cent to \$3.7 billion, spending on housing will decline 5.0 per cent to \$3.2 billion. Most of the decline in housing outlays — \$153 million of the \$170 million decrease — will take place in Ontario. High land costs, especially in the large urban centres plus high interest rates and a limited supply of private funds are expected to continue to hold down demand for single family dwellings. It is anticipated that starts for the first half of 1970 will be lower than in the corresponding period in 1969, but there should be a reversal of this trend in the latter half of the year, with the result that the number of starts in Ontario will again reach the 80,000 level.

The report states that the program, if realized, will provide moderate growth impetus to the economy without placing excessive demands on investment-supporting activities.

## Employment: January to March — 1970

Slow growth of the Canadian economy has sharply curbed expansion of the labour force. In the first quarter this year, the labour force averaged 8,027,000 persons, just 120,000 higher than a year earlier. The increase of 1.5 per cent compares with an annual increase of 2.9 per cent in 1969 and an unusually large year-to-year increase of 4.2 per cent in the first quarter of 1969.

Unemployment in Canada, at 542,000 or 6.7 per cent of the labour force in March 1970 reached its highest point since March 1963. Ontario, with an unemployment rate of 4.6 per cent is, in relative terms, less seriously affected than other regions. However, with 144,000 unemployed the province is experiencing its highest jobless rate since March, 1962. The 42.4 per cent increase in unemployment in Ontario, from 99,000 to 141,000 over the period March 1969 to March 1970 is higher than the percentage increase in any other region except the Prairies where an increase of 43.7 per cent occurred over the same time period. The

## Estimated Capital Expenditures, Ontario, 1970

Sectors	1970	1969	Per Cent Change
	\$ millions		
Housing	1,275.4	1,429.0	-10.7
Primary Industries	548.1	512.8	6.9
Manufacturing	1,762.0	1,248.6	41.1
Utilities	1,342.6	1,175.0	14.3
Trade, Finance and Commercial Services	899.5	673.2	33.6
Institutional Services and Government	1,268.8	1,199.3	5.8
<b>Total</b>	<b>7,096.4</b>	<b>6,237.9</b>	<b>13.8</b>

Source: DBS, *Private and Public Investment in Canada — Outlook 1970 and Regional Estimates*.



trend is a reflection of the softness of the labour market. Marginal workers are being squeezed out of the labour force, and many potential new entrants have been discouraged from seeking work by the knowledge that jobs are scarce.

Labour force participation rates are an indication of how persons react to changing labour market conditions. As shown in the accompanying table the total labour force participation rate increased from the first quarter of 1968 to the first quarter of 1969 and then decreased again in the first quarter of 1970. This could be partially due to the fact that when employment prospects are favourable, such as in 1969, persons who might otherwise not do so may be encouraged to seek employment. Accordingly, when job prospects are unfavourable such as they have been in the first quarter of this year marginal labour force participants may become discouraged and no longer seek employment.

#### LABOUR FORCE PARTICIPATION RATES, ONTARIO, POPULATION 14 YEARS OF AGE AND OVER

	First Quarter 1968	First Quarter 1969	First Quarter 1970
14-19 years	30.7	30.3	29.3
20-24 years	70.5	69.5	69.3
25-44 years	68.6	70.3	70.2
45-64 years	65.0	66.7	65.8
65+ years	14.4	15.3	13.3
Men	77.3	77.8	76.6
Women	35.4	37.0	36.8
<b>Total</b>	<b>56.1</b>	<b>57.1</b>	<b>56.4</b>

Source: DBS, Labour Force Survey.

Examination of the table below reveals that the participation rate for males seems to have fallen more sharply than that for females, while among the age groups, the 45-64 and 65+ groups appear to have been most seriously affected. A significant decline over the whole period is shown for the 14-19 age groups, however there is already an established declining trend in this area since more years of schooling have become a recognized necessity. Since the majority of older workers are male, this could explain the greater drop in male participation relative to that for females.

While attention has been focused mainly on the rise in unemployment it should also be noted that employment has been increasing. Provincial employment in March, 1970, totalled 2,892,000 — 25,000 above the comparable February figure and 36,000 higher than in March of last year. The important factor however, is that the labour force has been increasing far more rapidly than the number of job opportunities. The labour force increase between February and March, 1970, was 30,000 and the March total at 3,033,000 was fully 78,000 above the figure for March 1969.

Information now available for the month of April indicates that the Ontario labour force rose to 3,071,000, an increase of 38,000 over March 1970. At the same time the number employed reached 2,926,000 — 34,000 more than the previous month. The rate of unemployment in the province — 4.7 per cent — was slightly higher than that of 4.6 per cent recorded in March.

On a year-to-year basis the provincial labour force rose by 77,000 while the number employed rose 32,000 from 2,894,000 in April 1969.

Statistics for all of Canada indicate that unemployment dropped marginally from 6.7

per cent in March to 6.6 per cent in April. In April 1969 the rate was 5.4 per cent. Canada's unemployment rate for the first four months of 1970 averages 6.5 per cent compared with 5.7 per cent for the same period last year.

#### Canada Water Act Amended

Federal Energy, Mines and Resources Minister, J. J. Greene, recently introduced amendments to the Canada Water Act, including one giving the federal government the right to control phosphates and other nutrients. He told the parliamentary Committee on National Resources and Public Works that the amendments make the bill an even stronger means of combatting water pollution in Canada. The Canada Water Act has been in the hands of the Committee since early February. It is expected soon to go to the Commons for third and final reading.

The phosphate amendment enables the federal government to prohibit the manufacture and import of cleaning agents and water containers containing nutrients harmful to the ecological balance of Canadian waters. Fines of \$5,000 for each offence may be imposed and there is a provision for seizure of goods. The prohibition of phosphates is accompanied by a provision that regulations can be issued by the Governor-in-Council regulating other nutrient substances.

The amendments cover several areas of the Act, broadening its scope for redefining the need for federal-provincial co-operation and consultation in water pollution abatement. It is proposed that water resource management plans will be submitted to the provincial Minister involved for approval. Provision is made for public hearings in the planning process and the use of existing provincial agencies for joint programs.



Taxation and Fiscal Policy Branch,  
Department of Treasury and Economics

## INFLATION AND GOVERNMENT POLICIES IN 1969

### The Problem of Inflation

Like most industrial economies, Canada generated inflationary pressures as it moved towards high levels of economic growth and employment in the late 1960s. The major problem confronting Canadian governments today, however, is the persistence of strong inflation in the face of an economic slowdown, a slowdown caused largely by restrictive monetary and fiscal policies designed to reduce inflation. This apparent inconsistency of persistent inflation in the face of a softening economy indicates the existence of fundamental imbalances in the economy. The aim of this article, therefore, is first to identify the imbalances which make inflation structurally endemic, and second to raise the question of the design and application of remedial policies.

### Government Policies in 1969

In the past year, the federal government's fiscal and monetary policies have been directed almost exclusively toward the containment of inflation. Increases in federal expenditure were reduced below the growth of revenue to produce a budgetary surplus in 1969-70. A further surplus is planned for 1970-71. Credit availability has been limited and interest rates have risen sharply. In mid-1969, the federal government introduced a deferral of depreciation allowances on new commercial buildings in selected urban centres. The extension of this measure into 1970 is designed to reduce the level of construction activity, particularly in metropolitan Toronto.

At the same time, provincial and municipal governments trimmed expenditure growth in 1969-70. The difficulties of raising long-term capital and the constraints of revenue growth emphasized the need to control expenditures and to balance budgets. The net effect at the provincial-municipal level has been a reinforcement of federal fiscal and monetary policy and a deceleration of growth in the public sector.

Definite signs appeared by late 1969 that restrictive policy actions were affecting economic growth across Canada. While Gross Provincial Product in Ontario grew by 9.6 per cent in 1969, the growth rate is not expected to exceed 7.0 per cent in 1970. In Canada as a whole the growth rate is expected to fall from 9.3 per cent in 1969 to

**Table 1 — Per Cent Changes in GNP Implicit Price Deflator**  
Seasonally Adjusted, Annual Rates

1968			1969			
II	III	IV	I	II	III	IV
2.8	4.0	3.6	2.9	7.5	4.5	2.2

Source: Dominion Bureau of Statistics, National Income and Expenditure Accounts.

**Table 2 — Regional Percentage Unemployment Rates**  
Seasonally Adjusted

	1968	1969	1969 - Quarterly			
			I	II	III	IV
Atlantic	7.3	7.8	6.5	8.1	8.8	7.8
Quebec	6.5	7.0	6.3	7.0	7.2	7.4
Ontario	3.6	3.2	2.8	3.4	3.1	3.5
Prairies	3.0	3.0	2.6	2.9	3.0	3.3
British Columbia	5.9	5.0	5.0	4.5	5.1	5.4
Canada	4.8	4.7	4.2	4.8	4.9	5.1

Source: Dominion Bureau of Statistics, The Labour Force.

6.8 per cent in 1970. Two difficult problems will continue to confront government economic policy in 1970. First, current monetary and fiscal policies appear to be affecting production and employment as much as prices. Second, the burden of this economic adjustment is occurring with particular severity in eastern Canada in the form of rising unemployment; in addition, there are now definite signs of rising unemployment in Ontario.

Tables 1 and 2 contrast the course of inflation and unemployment in Canada in 1969. On the one hand, Table 1 indicates a modest decline in the rate of inflation in 1969, in terms of changes in implicit GNP prices. The peak period of pressure was in the second quarter of 1969 when the overall level of inflation was equal to an annual rate of 7.5 per cent. By the fourth quarter, however, prices were estimated to be rising less rapidly, although there have been signs of continued inflationary strength in early 1970.

On the other hand, Table 2 reveals a worsening in unemployment in 1969. On an annual basis the regional picture is mixed: unemployment has been increasing in Quebec and the Atlantic Provinces, holding steady in the Prairie Provinces, and falling in Ontario and British Columbia. In all cases, however, unemployment was higher

in the fourth quarter than it was in the first quarter of 1969.

First-quarter data for 1970 point to increasing economic weakness this year. For example, the reduction in the rate of economic growth in Ontario to about seven per cent implies an increase in average unemployment rates from 3.2 per cent in 1969 to over four per cent in 1970. Supporting this expectation are anticipated slowdowns in consumer purchases of durables, exports, residential construction and corporate profits. The rate of increase in prices is expected to decline nominally from 4.3 per cent in 1969 to 3.9 per cent in 1970. Such developments in Ontario will be matched by similar trends elsewhere in Canada, particularly in the Prairies, Quebec and the Atlantic Provinces.

In conclusion, Ontario and Canada have entered 1970 in a state of considerable uncertainty, with the economy showing symptoms of the early stages of a recession. In early 1969, by contrast, buoyant employment and persistent inflation presented a clearer set of targets for economic policy. Current expectations pose serious doubts about the wisdom of maintaining the single-purpose thrust of monetary and fiscal policies against inflation.

Governments must reappraise the cost of continued deflationary policies in terms of



increased unemployment and below-potential economic growth. Consideration must be given to the implications of further restraint at the provincial-municipal level in terms of the accumulation of serious shortages in essential economic and social services and facilities. It is far from certain that the continued application of broadly restrictive monetary and fiscal policies will be effective in preventing increased inflationary pressures. These questions suggest the need for a basic re-examination of the ways in which government policy instruments can be used more flexibly and selectively to achieve orderly economic growth without inflation.

### **ECONOMIC STABILIZATION POLICIES IN 1970**

This section examines the effectiveness of economic stabilization policies in counteracting inflation in Canada today. It underlines the urgent need for a more extensive inter-governmental analysis of existing economic policies. However, the discussion will be confined to the central issues and measures.

#### **Present Policies of Governments**

The federal government has stated its remedy for inflation: reduce the growth of aggregate demand even if this means increasing unemployment. In addition, some measures have been devised to have a special restraining influence on the growth regions of Ontario, Alberta and British Columbia. In its diagnosis of the problem, the federal government has maintained that excess demand in the growth regions is causing an inflationary surge in costs and prices that is overlapping into other regions.

The Ontario Government made a commitment in its 1969 Budget Statement to achieve a surplus in the 1969-70 fiscal year. This policy was adopted because the economy was sufficiently buoyant to absorb anti-inflationary restraints without creating unemployment. For 1970-71 the Ontario budget is holding to a prescription of modified restraint by avoiding inflationary tax increases and new demands on domestic capital. However, it will be moderately expansionary to offset the worsening employment situation.

Provincial government research examining the role and impact of the fiscal operations of the various levels of government in Ontario has demonstrated that federal fiscal actions have a built-in tendency to restrain

economic growth in Ontario. In times of increased federal restraint this "fiscal drag" in Ontario increases faster than in other regions. For example, in 1968-69, Ontario was subjected to a heavy burden of restraint by federal tax and expenditure policies equivalent to a 6.25 per cent loss of provincial personal incomes. In 1969-70, Ottawa's target of an overall federal surplus withdrew about \$1.8 billion from Ontario businesses and residents which increased the "fiscal drag" to more than seven per cent of personal incomes. Any further measures of economic tightening could cause increased unemployment and a recession whose repercussions would be felt throughout Canada.

#### **The High Cost of Unemployment**

The Ontario Government recognizes that the control of inflation has a high priority among economic policies. However, it does not agree that the objectives and methods of current fiscal and monetary policy are irrefutable. If the federal and provincial governments continue to retard economic growth, Canada could experience both higher unemployment and inflation as in the mid- and late 1950s. The basic strategy of price containment through tight monetary and fiscal policy measures has a number of disadvantages:

- it is economically wasteful because it puts people out of work and limits the nation's growth capacity;
- the less-developed regions suffer most;
- it hits industries indiscriminately and regardless of their direct influence on prices;
- it hurts smaller businesses and raises the cost of doing business;
- it restricts the supply and raises the cost of housing;
- it is accompanied by rising unemployment, hitting hardest at low-income earners and unorganized labour;
- it results in slower growth, lowering capacity utilization and productivity, and raising the unit costs of production;
- even if inflation is cured, the problem of the eroded purchasing power of the fixed-income groups remains unless compensation is provided.

Ontario, with a rapidly growing population and labour force, needs a continuous stream of private and public investment to create new jobs and raise living standards. Any attempt to cure inflation by creating

unemployment runs counter to the Ontario Government's objective of keeping unemployment at no more than three per cent of the labour force. This is a reasonable economic objective and it is imperative that a more sophisticated strategy than induced unemployment be found to cure inflation. The Ontario Government is not willing to accept the view that unemployment is a just and effective way of solving the problem. The effects will fall on the lowest income-groups in the community. It is inconsistent to propose economic goals of tax equity to help these citizens, while contributing to their loss of livelihood as the price of solving inflation.

#### **Is Inflation Caused by Goods-Producing Industries?**

Inflation has not been a severe problem in most of the manufactured goods industries. There is evidence of the moderate price behaviour in manufacturing industries in the index of consumer prices: durable goods' prices in 1969 rose by only one per cent. Prices of consumer non-durable goods, excluding food, were up by 3.1 per cent, which represented a sharp reduction from the 4.5 per cent of 1968.

The demand for consumer durable goods has weakened in recent months. Unemployment and lay-offs are increasing in those Ontario communities that rely on durable goods industries. The proposed use of consumer credit controls could reduce the already faltering demand for consumer durables. Further restrictive policies aimed at this sector could easily aggravate general recessionary tendencies.

#### **International Factors**

The international competitiveness of Canada is not immediately endangered by present inflationary trends. The major cost and price problems have been in goods and services produced largely for domestic consumption, for example, government services, construction, housing, food and personal and business services. It is likely that Canada's trading deficit on current account will be more affected by changes in economic growth here and in the United States, resulting from fiscal and monetary policies, than by an erosion of Canadian price competitiveness. The collapse of Canada's world wheat markets is of more immediate significance to the balance of payments and to regional economic health than price increases of manufactured goods.



### The Regional Aspects

Federal policies are designed to deflate the Ontario economy. The recent federal budget extended the deferral of depreciation allowances on new commercial buildings in Ontario cities. Other selective measures included:

- a tighter restriction of federal spending and loan activities in Ontario than in other regions;
- persuasion of the banks to differentiate regionally in their lending policies;
- the proposal to control consumer credit, the impact of which will fall heavily on Ontario manufacturers of durable goods.

In total these policies constitute a broad, unitary-state application of economic policy rather than a co-ordinated, intergovernmental package to increase output and lessen price increases.

The inflexibility of these policies is demonstrated by their inability to resolve the problem of inflation without penalizing economic growth in Ontario, and their further inability to increase output in the under-employed regions. High levels of unemployment have not stabilized prices in the low-growth regions. This is particularly relevant in the context of the alleged transmission of inflation from Ontario to other regions. Since little is known about inter-regional trade patterns, the assertion can neither be proven nor disproven with certainty.

A number of factors tend to produce uniform inflationary pressures in all regions. Among these are the effects of:

- monetary policy and the level of interest rates;
- the pace-setting wage and salary settlements for employees under federal jurisdiction;
- the steady increases in property taxes and provincial taxes across the country which register directly in price indexes and result in compensatory wage demands.

The use and extension of deferred depreciation allowances to cool off the construction industry must be acknowledged now as a failure. It underestimates the severe restraining effects of monetary policy and the strength and importance of service industry capacity; it has merely emerged as one more cost element in rising construction prices. This kind of device lacks real selectivity because it cannot discriminate according to local priorities. It is not likely to succeed without provincial-municipal economic planning support. The unilateral implementation of

this measure and its subsequent failure are indicative of the urgent need for alternative methods of establishing regional economic stabilization policies.

### THE STRUCTURAL PROBLEMS OF INFLATION

This section examines some of the longer term structural problems in the Canadian economy encouraging inflation. Among these are public sector growth, the inflationary effects of tax increases, expansion of the service sector, population pressures, accelerated urbanization, and housing shortages. These longer-term structural forces are typically those which need co-ordinated long-run planning and cannot be effectively handled with short-run economic policies.

#### The Growth of the Public Sector

The competition between the public and private sectors in the 1960s was accompanied by intense intergovernmental competition for tax fields and unco-ordinated expansion of spending programs. Federal shared-cost programs, such as medicare, were imposed at a time when the public sector was already over-extended and unprepared to supply the required medical manpower inputs. On the finance side, the federal white paper proposals on tax reform were introduced without consideration of the parallel problems of

tax-sharing and integrated federal-provincial and municipal tax-structure reform.<sup>1</sup>

Public sector command of national economic resources grew from about 31 per cent of Gross National Product in 1960 to almost 35 per cent in 1969. Total government revenues, including Canada Pension Plan funds, increased from \$9.4 billion in 1960 to about \$24.7 billion in 1969, an increase of 164 per cent compared to a growth in Net National Income of 104 per cent.<sup>2</sup> This expansion of the public sector was accomplished by bidding away resources from the private sector. This inevitably led to compensatory price and income demands in the economy at large and put pressure on labour costs in the construction and service industries.

#### Tax "Feed-Back" and Inflationary Cycles

Governments expanded their share of Gross National Product in the 1960s by raising taxes and incurring frequent deficits. In addition to the normal progressivity of personal income taxes there were increases in income tax rates, social security taxes, medical premiums, retail sales taxes, and property taxes, all of which accelerated the rate of growth of public sector revenues. Table 4 illustrates how the ratio of government tax revenues to personal income rose from 37 to 43 per cent, a structural shift that increased inflationary wage and salary demands.

**Table 3 — Expansion of the Public Sector in Canada: Public Sector Expenditures Expressed as a Percentage of Total Gross National Expenditure**

	1960	1969
Public Sector Expenditures	Per Cent	
Goods and services	18.6	19.8
Transfers to persons	8.7	11.0
Other payments	6.4	8.0
<b>Total:</b> (i) gross	33.7	38.8
(ii) excluding intergovernmental transfers	30.9	35.1

Source: Dominion Bureau of Statistics, National Income and Expenditure Accounts (unrevised).

**Table 4 — Public Sector Revenues and Personal Income**

	1960	1965	1969
1. Personal Income (\$ million)	25,075	35,149	57,002
2. Public Sector Revenues (\$ million)	9,360	14,729	24,745
3. Revenues as Per cent of Income	37	42	43

Source: Dominion Bureau of Statistics, National Income and Expenditure Accounts (unrevised), public sector revenues exclude investment income, withholding taxes and federal transfers to the provincial-municipal sector.

<sup>1</sup>Ontario's views on integrated tax reform were set out in "Reform of Taxation and Government Structure in Ontario", Ontario Budget 1969. Ontario Department of Treasury and Economics, Taxation and Fiscal Policy Branch.

<sup>2</sup>Source: Dominion Bureau of Statistics, National Income and Expenditure Accounts (unrevised), Ottawa.



Much of this revenue was fed back into the personal income streams, either as direct transfer payments or as benefits in the form of services. The indirect tax increases affected individuals psychologically, and registered statistically as inflation in the Consumer Price Index.<sup>3</sup>

While taxes are a compulsory diversion of personal and business income and savings, the public does not accept this as a non-negotiable fact. Wage, salary and fringe benefit demands, and the competitive bidding for personnel, are sensitive to tax changes for many months after they occur. There is, therefore, a dual aspect to tax changes; in the first round the taxes may register as a decline in personal disposable income; in the second round compensatory wage and salary adjustments occur in response to this reduction in disposable income. Technically, if the market place is relatively fluid, only one tax increase is required to move an inflationary wave through the entire range of goods and services. Taxes are powerful inflation generators because they apply across broad industrial and regional segments of the market rather than in isolated sectors.

### Urbanization and Population Growth

During the 1960s the high-growth regions absorbed very large numbers of people. The population of Ontario grew by one-quarter and that of British Columbia by one-third. Table 5 shows the comparative changes for the various regions over the last ten years.

Most of this growth occurred in the large urban centres. In the decade 1956-66 the absolute population of Ontario cities of 100,000 and over increased by 1.35 million persons, whereas the total increase in population in this period was about 1.50 million persons. This continuing concentration of

people and economic activities in the larger cities has generated economies of scale in many industries, but it has also produced pressures on the availability of serviced land and land prices, as is evident in the growth of apartments and high-rise office blocks. It has also demanded massive public capital outlays for schools, roads, hospitals, universities, sewage systems, parks, and recreation and conservation areas. This type of growth pressure contributed strongly to price increases over the period.

### Costs in the Public Sector

In addition to the inflationary bias of public sector growth, there has also been a rapid rise in unit costs in public services over the past decade. In part, this was a result of the intense competition for skilled personnel between the private and public sectors of the economy. The public sector's requirement for teachers, nurses and professional and managerial skills rose rapidly through the 1960s in response to the need to effectively staff and manage the large number of community service facilities brought into operation. Standards of public service performance and administration were raised and the price for the necessary skills had to be met in order to attract competent staff.

The growth in service industry and public sector employment was one cause of the rapid rise in wages and salaries for these groups. However, there was also a long-run pressure to narrow wage and salary differentials between the public sector and the commercial sector. Although more restraint in the public sector might have lessened the strength of this movement, there would still have been a catch-up thrust in "service-occupation" salaries which would have occurred regardless of the impact of monetary and fiscal policy.

Inflation in operating costs and lags in the application of new technology have been a particularly severe and difficult problem in the provision of a wide range of public services. It is therefore a high priority of current Ontario Government policy to determine and to implement long-run managerial and technical changes in public services to improve productivity and lower unit costs. The Ontario Government's Productivity Improvement Project utilizes both business and government expertise to achieve these objectives. The establishment of a federal-provincial task force on cost-effectiveness in shared-cost programs is another example of the concern in this area and of the steps being taken to remedy the problem.

### The Special Importance of Housing

Wage and salary demands are extremely sensitive to trends in the price of consumer necessities, such as shelter. Rent and the costs of home ownership constitute a large proportion of most family budgets; hence, the effect of inflation on these important costs leads the consumer to adjust his wage demands accordingly.

By 1969 shelter costs were rising at 7.5 per cent a year, which was faster than any other component in the Consumer Price Index. This behaviour resulted from four factors, two of which emanate directly from government policies:

- the high cost and limited availability of mortgage money;
- the dependence of municipal governments on property taxes as a major source of revenue;
- high rates of family and household formation;
- the impact of accelerated urbanization on land prices.

Policies of monetary restraint are counter-productive in curing inflation in this sector because the basic problems are long-term in nature. The housing sector requires co-ordinated public policies at all levels of government to minimize supply bottlenecks, speculative pressures, financing delays and high tax burdens.

### CO-ORDINATING ECONOMIC POLICY IN CANADA

This section examines some alternatives to existing crisis-oriented economic policies. In particular, it suggests that Canada should aim for steady growth in the public and

**Table 5 — Regional Population Growth in Canada — 1959-1969**

	Population (000's)		Change 1969/59	
	1959	1969	000's	%
Atlantic	1,843	2,012	169	9.1
Quebec	5,024	5,984	960	19.1
Ontario	5,969	7,452	1,483	24.8
Prairies	3,046	3,499	453	14.9
British Columbia	1,567	2,067	500	31.9
Canada	17,483	21,061	3,578	20.5
Ontario as Per Cent of Canada	34.1	35.4	41.4	

Source: Dominion Bureau of Statistics, Estimated Population of Canada by Province, Ottawa.

<sup>3</sup>It is a limitation of the present method of registering inflation in official statistics that, if there is an increase in public sector output which is financed by indirect taxes, then components of the Consumer Price Index will automatically increase, regardless of whether

the public is "buying" an increased volume of public services with the increased taxes. In other words, if all public sector expansion in the 1960s had been financed by indirect taxes, then official statistics would have registered a significantly larger increase in the Consumer

Price Index. On the other hand, if they had been financed entirely by increases in personal income taxes, the direct effect on statistical measures of consumer prices would have been zero.



housing sectors. It also suggests the need for development of more effective and flexible policies to stabilize the private sector.<sup>4</sup>

### The Economic Objectives of Federalism

Canada lacks national economic goals of an explicit order.<sup>5</sup> Currently economic and social targets are typically embodied in the piecemeal introduction of individual programs, for example, medicare, regional development and tax reform proposals. In this process the overall priorities, the available options, and the very important ramifications for the total public sector are inadequately considered. For example, the substantial build-up of federal government fiscal capacity, as a result of the combination of a high revenue growth capacity and recent tax increases, has not been linked with any revealed strategy of economic objectives. (This build-up would be accelerated by the initial revenue gains and the increased growth capacity of income taxes under the new federal white paper proposals for taxation reform.) Under these circumstances, it is not possible at the present time to develop a co-ordinated set of federal and provincial-municipal priorities within a cohesive policy framework.

### The Weakness in Existing Mechanisms of Co-ordination

The difficulty of controlling inflation in Canada illustrates the fundamental weaknesses in federal-provincial co-ordination of economic policy. The Standing Committee on Finance, Trade and Economic Affairs, of the Canadian House of Commons, has made the following two points in reporting on inflationary influences:

... the influence of governments at all levels needs to be examined in far greater detail. We noted that there has not been enough collaboration between the federal government and the provinces in discussing their separate spending plans.

The public should be able to expect that future expenditures of governments at all levels will occur only within the context of a set of clearly established priorities based on cost-benefit analyses and that existing expenditures will be perpetuated only if they pass continuing examination that utilizes worthwhile efficiency criteria.<sup>6</sup>

Current economic and fiscal debates in Canadian federalism are locked in a rigid framework of confrontation. To improve this situation governments must develop basic

research into new policy options and approaches. Little progress has been made in this regard since the Rowell-Sirois studies in the late 1930s. New policy systems must be more sensitive to the economic subtleties of federalism, rather than oriented to unitary-state economics. In particular, the growth of provincial and municipal responsibilities and functions must be recognized and accepted as a fact of federal life in Canada.

It is a matter of historical record that existing approaches to economic policies in Canada have been unable to achieve a lasting solution, either to long-run differences in regional growth or to short-term fluctuations in prices and business activity.<sup>7</sup> A modernized fiscal policy would provide greater recognition of the complexities of inter-regional linkages and a more appropriate balance between the private and public sectors. It would also make provision for long-term technological changes, accelerated urbanization, and the rapid growth of the service industries.

### The Importance of the Provincial-Municipal Sector in Policy Co-ordination

The distribution of powers by functional importance is weighted heavily in the direction of the provinces. The provincial-municipal sector accounts for close to 60 per cent of public sector expenditures in Canada, and for about 80 per cent of capital investment by all governments. Ontario accounts for 36 per cent of total provincial-municipal spending and is the source of about 42 per cent of the federal government's revenues. The growing importance of the provincial-municipal sector and the fiscal significance of the high-growth regions should be accompanied by a more important role for the provinces in overall policy formulation.

### Economic Data Requirements

The economic data requirements of a co-ordinated fiscal policy extend beyond the present aggregative methods of the Tax Structure Committee.<sup>8</sup> An urgent need exists to develop the economic data appropriate to a federal system of regional economies, each with unique characteristics and growth problems. The elements of a co-ordinated fiscal policy become ambiguous and unreliable in the absence of sound basic economic data on gross provincial products, regional flows-of-funds, the federal government impact in each province, and the inter-regional flows of

goods and services. In particular, there is a need for:

- a clearer recognition in federal government statistical gathering operations that Canada is composed of distinct regional economies;
- official economic data showing the impact of federal fiscal and monetary operations in each regional economy;
- a more intensive effort in economic forecasting and analysis at both the national and regional levels, with ample time for all participants to study and discuss the results;
- joint consideration of anticipated monetary policy including the regional implications of changing monetary conditions and the regional aspects of flow-of-funds;
- joint consideration of private and public sector capital needs, public borrowing, debt management and cash reserve policies, and utility financing;
- breakouts of federal revenue and expenditure projections by province, so that provincial economic and fiscal planning can take federal actions into account;
- consideration of the impact of tariff and trade policies on regional economies.

Only with improved economic data of this kind can effective liaison between governments be developed.

### Sectoral Stabilization Policies

According to conventional economic theory, the public sector should manipulate its revenues and expenditures to be counter-cyclical. For the most part, this has proven to be an unobtainable goal. Discretionary changes are still cumbersome and likely to generate procyclical, or perverse economic effects.

Many of the difficulties of economic policy-making could be avoided if governments in Canada could agree to a long-run strategy to stabilize public sector growth. Such planned and co-ordinated development of the public sector over the long-run would have to be supplemented by automatic tax and social security stabilizers.

To define and stabilize the rate of growth in the public sector would require intergovernmental agreement on:

- the target share of GNP to be allocated to public sector uses over a period of years;
- a commitment to stable rates of expansion by each jurisdiction;
- an agreed long-term developmental plan with explicit priorities;

<sup>4</sup>Ontario has advanced proposals on the development of federal-provincial policy co-ordination at numerous intergovernmental conferences. See, for example, The Purpose and Objectives of the Tax Structure Committee, Ontario Department of Treasury and

Economics, Taxation and Fiscal Policy Branch.

<sup>5</sup>See Economic Council of Canada, Sixth Annual Review: Perspective 1975, Ottawa.

<sup>6</sup>Standing Committee on Finance, Trade and Economic Affairs, Minutes of Proceedings and Evidence. No. 14, second session, twenty-

eighth Parliament, 1969-70.

<sup>7</sup>For an evaluation of post-war fiscal policy actions, see Report of the Royal Commission on Taxation, Ottawa, 1966, Vol. II, Chp. 3.

<sup>8</sup>See The Purpose and Objectives of the Tax Structure Committee, *Op. cit.*



- performance targets, relating to cost and service levels in the public sector, to minimize the opportunity costs of public expenditures;
- automatic compensatory payments to the fixed and low-income persons, involving co-ordinated federal-provincial welfare systems;
- a long-range tax co-ordination program to lessen the provincial-municipal sector reliance upon regressive sales and property taxes and to increase their access to income taxes;
- timing and queuing of public sector issues in domestic capital markets.

This type of co-ordination is urgently required, for example, to encourage long-run orderly expansion of the supply of housing. The Canadian Parliamentary Standing Committee on Finance, Trade and Economic Affairs, in its fourteenth report says of the housing sector:

In the Committee's view the housing program should be used to meet the housing needs of the country and should not be used as a device for the stimulation or otherwise of the economy.<sup>9</sup>

This statement accords with the Ontario Government's view that housing is a high priority sector and should be incorporated into long-term stabilization plans.

The realization of stable public sector growth would not eliminate the need for counter-cyclical measures, especially where changes in foreign conditions affect Canada's balance of payments and the exchange value of the dollar. Nor would it eliminate the volatility of private investment, consumer durable sales, farm inventories, and foreign trade. It would, however, go a long way towards effectively isolating these problems for special stabilization treatment. There still would be a need to determine priorities in the

private sector and thus establish residual trade-offs against public sector programs.

### Co-ordination of Tax Policies

The co-ordination of tax policies is one of the most pressing problems of Canadian federalism. The intergovernmental Tax Structure Committee was formed in 1964 for the purpose of projecting the expenditures and revenues of the public sector, and of studying the problem of fiscal balance and tax co-ordination. Its activities did not result in any major improvements in federal-provincial tax sharing. Two new ground rules have been established by the federal government since 1966. They are:

- no further increases in fiscal transfers to the provinces;
- the development of the Principle of Equal Access.

Under the first rule, the federal government argues that it cannot consider further increases in abatement of the personal income tax to the provinces because it needs to maintain a commanding majority position in the field for fiscal policy purposes. The Ontario Government has pointed out, however, that federal occupancy is far greater than that required both to meet the growth of its existing expenditure commitments and to change the total federal and provincial income taxes for fiscal policy purposes. This extra occupancy merely serves to provide the federal government with a high-growth revenue capacity to finance the continued introduction of new expenditure programs.<sup>10</sup>

Under the Principle of Equal Access each level of government is held responsible for raising its own revenues to finance expenditures. These two rules have prevented the development of a co-ordinated and harmonized federal-provincial tax structure in Canada. The federal white paper proposals

on taxation reform would worsen the situation by pre-empting the provinces from increased use of income taxes, and by increasing the flow of fiscal resources to the federal government. If the revenues resulting from these proposals are not to be shared with the provinces, then the problem of fiscal imbalance at the provincial-municipal level will be increased and the provision of essential public services will be adversely affected. The major question in tax co-ordination for Canada is how, under a regime of independent taxation, the various governments will move to solve their financing problems without the destruction of a uniform Canadian tax structure.<sup>11</sup>

New approaches to this problem are necessary. There is a need for new conventions within which independent tax actions should take place. Existing intergovernmental finance discussions should be moved beyond the consideration of total revenue and expenditure projections into the following areas:

- the wider interprovincial implications of particular tax changes within the total tax framework;
- the economic implications and tax-exporting properties of certain tax policies;
- insight into which taxes are best used for particular types of objectives by federal and provincial-municipal governments;
- the essential requirements for complementary and non-competitive actions.

### Conclusion

The foregoing article has reviewed some of the problems of designing and co-ordinating economic policies appropriate for Canada's diversified economy. It suggests that new initiatives are required to define national objectives and to strengthen Confederation. The paper is offered as an initial contribution by the Government of Ontario to this process.

<sup>9</sup>Standing Committee on Finance, Trade and Economic Affairs, Minutes of Proceedings and Evidence, No. 14, second session, twenty-eighth Parliament, 1969-70.

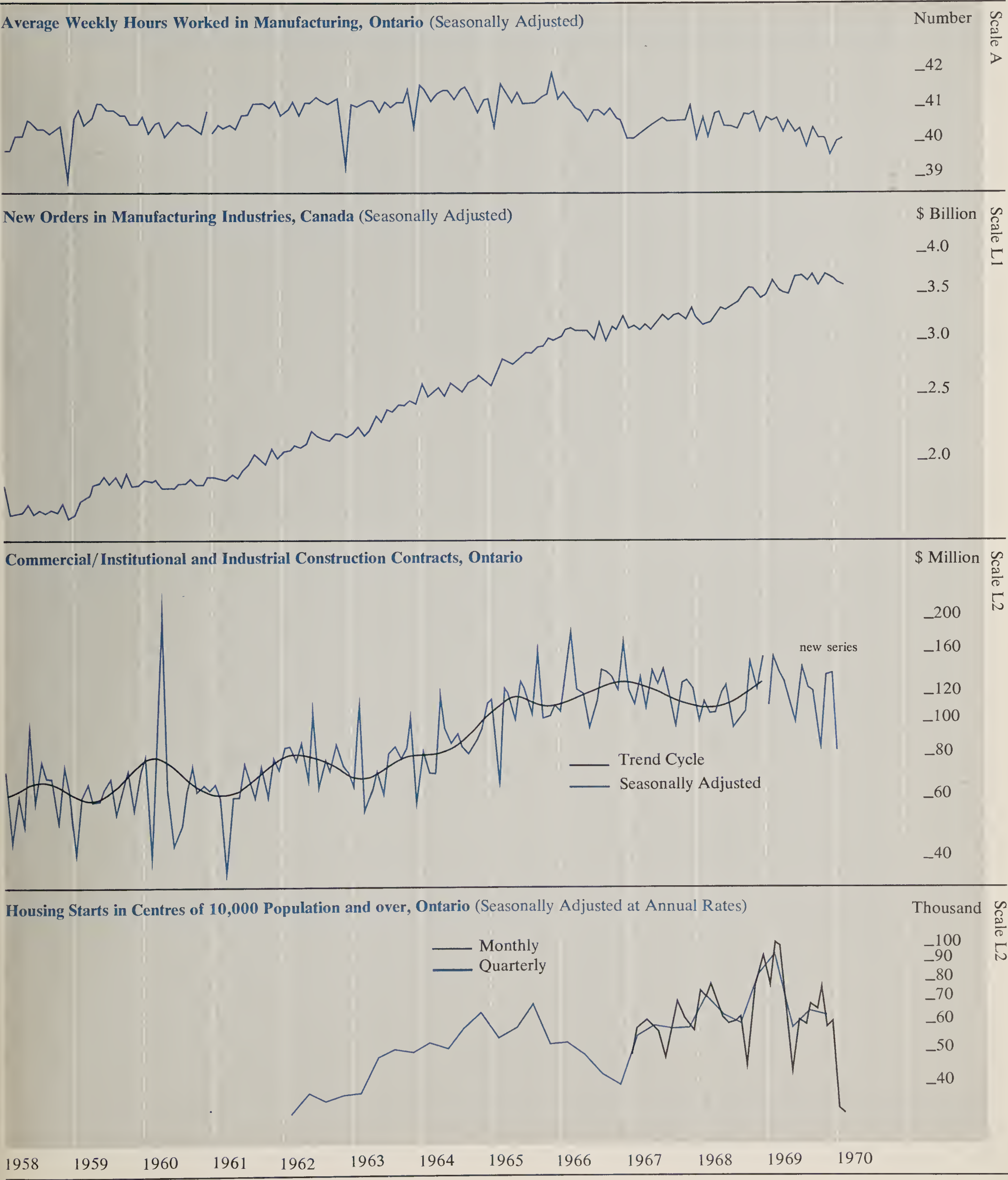
<sup>10</sup>See Alternative Methods of Transferring Federal Tax Revenues to the Provinces, Ontario Government, August, 1966: presented to the federal-provincial Continuing Committee on Economic and Fiscal Matters, Mont Gabriel, September, 1966.

<sup>11</sup>See Intergovernmental Finance and Ontario's White Paper on Provincial-Municipal Reform, Ontario Department of Treasury and Economics, Taxation and Fiscal Policy Branch: presented to federal-provincial Constitutional Committee, Ottawa, June, 1969.



# Selected Economic Indicators

## Leading Indicators





## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

\$ Billion  
 \_30  
 \_25  
 \_20  
 \_15  
 \_14  
 \_13

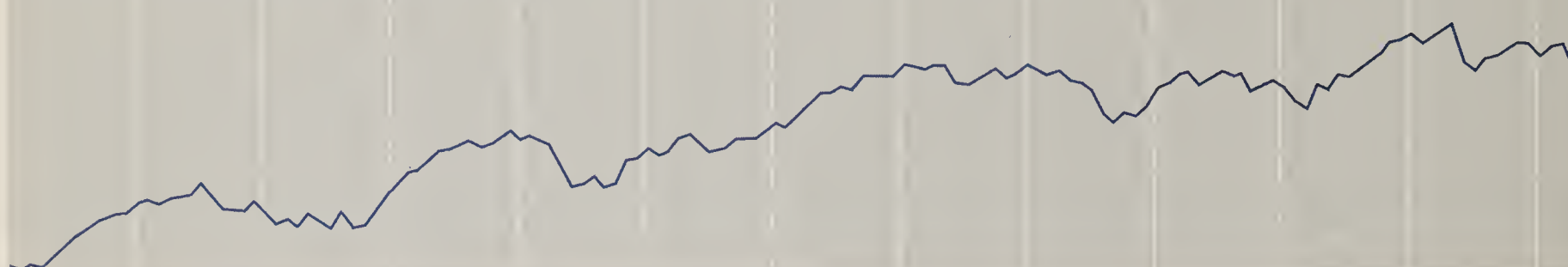
Scale L1



**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Index  
 \_200  
 \_180  
 \_160  
 \_140  
 \_120  
 \_100

Scale L2

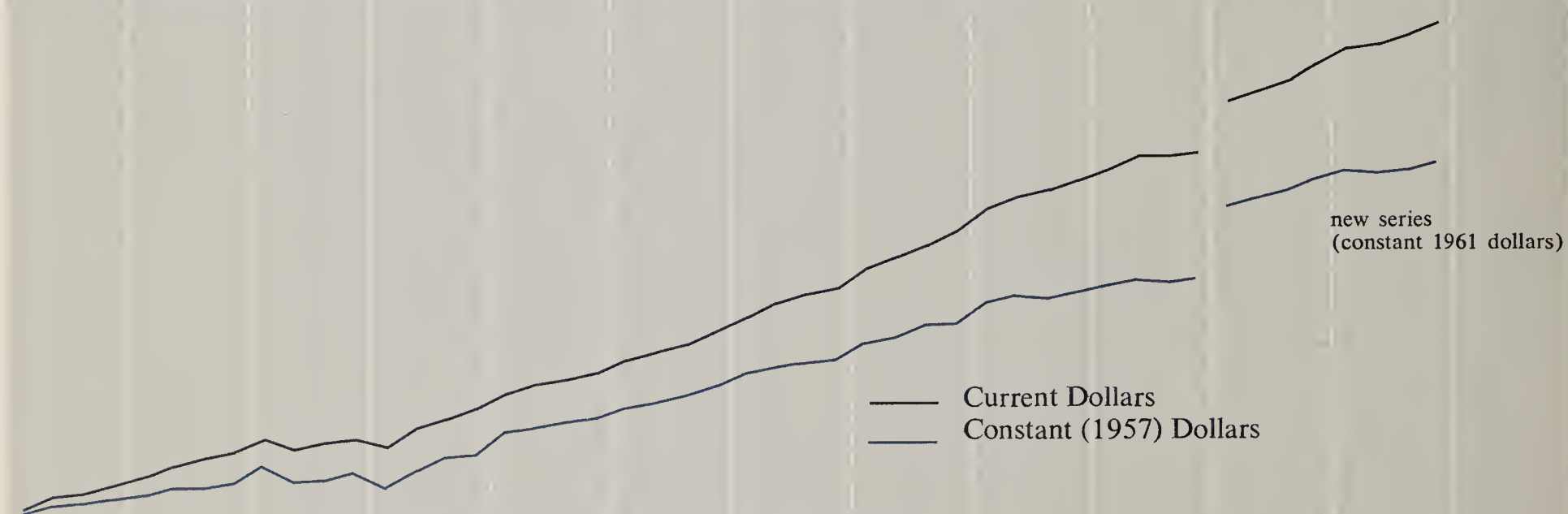


## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion  
 \_80  
 \_70  
 \_60  
 \_50  
 \_40  
 \_35

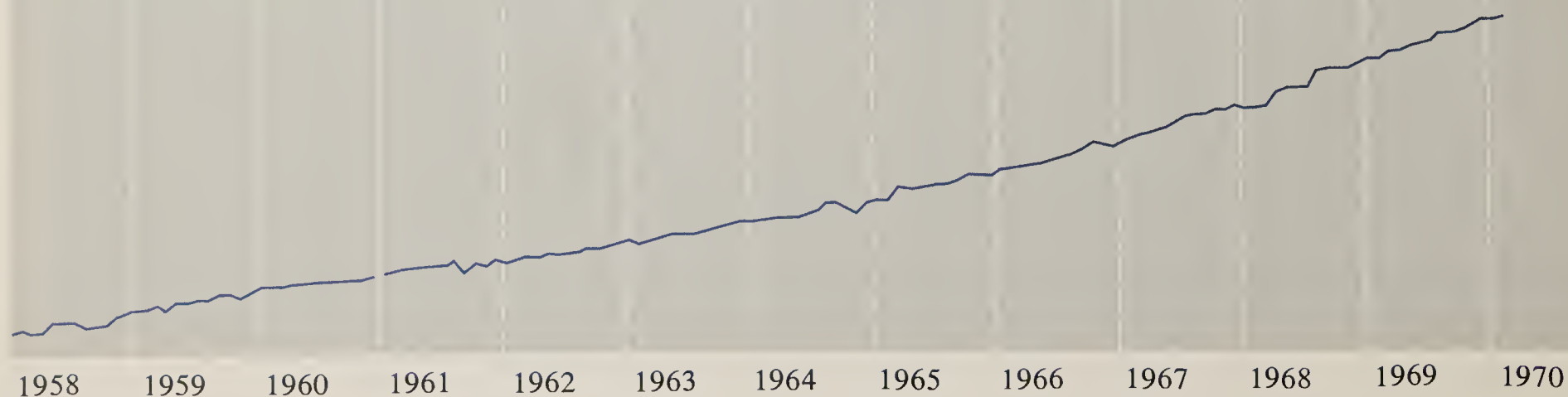
Scale L1



**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

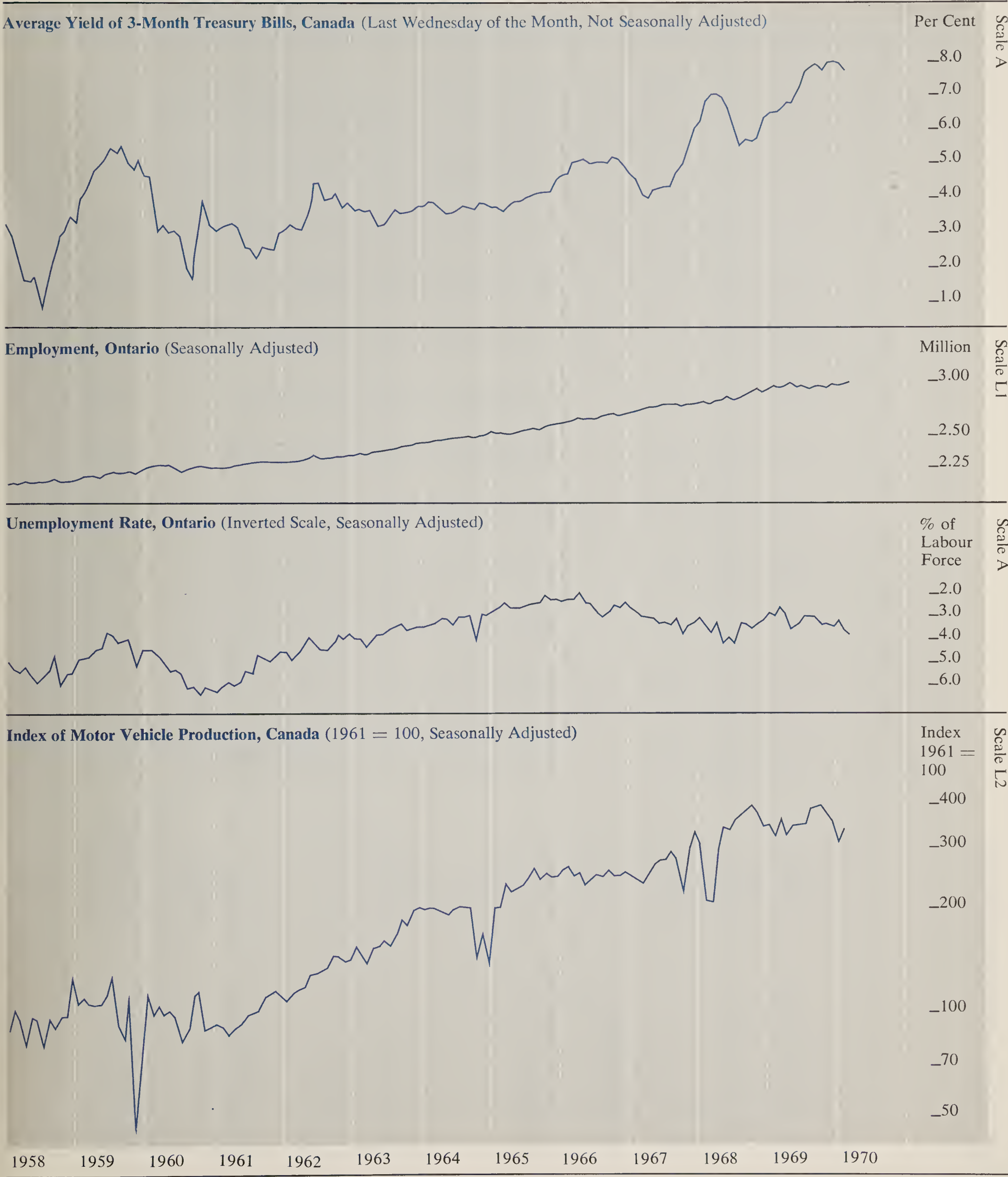
Dollars  
 \_3.00  
 \_2.50  
 \_2.00

Scale L1





# Coincidental and Lagging Indicators





		1969												1970											
		Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.										
Leading Indicators																									
Average Weekly Hours Worked in Manufacturing		40.4	40.5	40.1	40.4	40.1	40.2	39.6	40.3	39.9	39.9	38.4	39.7	39.9	39.6										
New Orders in Manufacturing Industries <sup>c</sup>		3,693	3,575	3,539	3,564	3,743	3,741	3,690	3,770	3,634	3,754	3,728	3,662	3,624											
Commercial/Institutional and Industrial Construction Contracts		157.9	140.6	126.1	112.8	93.9	144.0	127.0	123.2	86.6	137.3	140.0													
Urban Housing Starts (Annual Rate)		109,700	102,400	79,900	45,300	63,900	60,800	69,300	67,300	78,300	59,100	64,700	36,600	34,800	55,700										
Money Supply <sup>c</sup>		27,927	28,251	28,331	28,336	28,638	28,324	28,292	28,403	28,472	28,580	27,728	27,695	27,816	27,900										
T.S.E. Industrial Index <sup>u</sup>		185.20	190.58	195.31	197.23	177.34	168.65	175.43	178.15	182.11	187.65	186.37	177.89	183.92	185.17										
Business Failures <sup>u</sup>		59	55	58	48	35	32	51	52	64	54	53	56	71	82										
Business Failures — Liabilities <sup>u</sup>		3.2	2.2	3.2	1.9	2.0	0.9	2.6	4.8	3.4	4.6	2.2	9.9	18.7	4.0										
Coincidental and Lagging Indicators																									
Gross National Product <sup>c</sup> (Annual Rate)			76,492			76,968			78,684						80,252										
\$ Million																									
Average Hourly Earnings in Manufacturing		2.84	2.88	2.89	2.92	2.93	2.94	2.97	2.97	2.99	3.02	3.06	3.06	3.08	3.10										
3-Month Treasury Bill Rate <sup>c,u</sup>		6.43	6.58	6.80	6.74	7.13	7.62	7.69	7.77	7.60	7.76	7.81	7.78	7.60	7.00										
Cheques Cashed in Clearing Centres <sup>1</sup>		6,032	6,428	6,243	6,066	6,152	6,458	6,560	6,570	6,526	6,521	6,240	6,078	6,099											
Retail Trade		886	862	866	866	875	884	886	901	892	895	909	891	869											
Labour Force		3,037	3,019	3,038	3,071	3,035	3,028	3,004	3,027	3,035	3,030	3,064	3,044	3,066	3,098										
Employed		2,947	2,940	2,948	2,958	2,926	2,935	2,910	2,932	2,930	2,927	2,957	2,948	2,957	2,981										
Unemployed		90	79	90	113	109	93	94	95	105	103	107	96	109	117										
Unemployed as % of Labour Force		3.0	2.6	3.0	3.7	3.6	3.1	3.1	3.1	3.4	3.4	3.5	3.2	3.6	3.8										
Wages and Salaries		1,256	1,264	1,271	1,288	1,295	1,318	1,303	1,312	1,318	1,336	1,347													
Index of Industrial Employment		131.2	131.5	131.4	131.4	131.0	129.6	129.3	129.6	130.7	132.7	132.8	132.1	133.1	132.8										
1961 = 100																									
Index of Industrial Production <sup>c</sup>		168.0	171.3	167.7	167.0	167.1	166.8	164.5	165.9	165.6	169.3	172.0	171.1	174.4	171.1										
Total Manufacturing <sup>c</sup>		167.5	171.3	167.3	168.5	169.0	169.3	166.5	166.8	166.7	169.5	170.7	167.8	171.0	167.7										
Non-Durables <sup>c</sup>		150.8	153.6	150.2	150.6	151.1	151.6	152.5	153.0	152.4	153.4	154.3	152.3	154.3	152.5										
Durables <sup>c</sup>		187.8	193.0	188.2	190.3	190.8	191.0	183.7	183.8	184.1	189.2	190.7	186.8	191.4	186.4										
Mining <sup>c</sup>		160.6	162.1	155.7	145.5	142.6	138.9	136.2	141.8	140.3	151.8	163.4	170.2	175.7	169.5										
Electric Power and Gas Utilities <sup>c</sup>		184.3	184.7	186.2	186.1	187.1	189.0	190.1	194.6	195.5	194.6	197.0	201.0	203.0	203.2										
Primary Energy Demand (Annual Rate)		58.45	59.49	59.20	58.54	59.12	60.28	58.83	58.39	59.09	59.56	63.13	64.53	63.91	62.94										
Exports (including re-exports) <sup>c</sup>		1,243.8	1,295.7	1,194.2	1,233.6	1,212.5	1,196.0	1,161.7	1,293.4	1,283.0	1,285.0	1,312.9	1,457.3	1,403.7	1,366.2										
Imports <sup>c</sup>		1,194.2	1,178.3	1,149.3	1,166.6	1,215.2	1,124.2	1,136.3	1,220.1	1,206.7	1,223.2	1,215.0	1,120.2	1,232.4	1,242.1										
Unclassified Indicators																									
Foreign Exchange Reserves <sup>c,u</sup>		2,820	2,779	2,782	2,760	2,623	2,565	2,594	2,539	2,629	2,613	2,616	2,698	2,777	2,936										
Industrial Materials Price Index <sup>c,u</sup>		263.5	264.1	267.7	271.8	270.6	270.5	269.2	270.4	266.8	267.8	271.5	272.3	272.3	275.7										
Consumer Price Index <sup>c,u</sup>		122.6	123.2	124.6	124.9	125.9	126.4	126.9	126.6	126.8	127.4	127.9	128.2	128.7	128.9										

<sup>c</sup>Statistics for Canada.  
<sup>u</sup>Not seasonally adjusted.  
<sup>1</sup>Ontario less Toronto.



HA/747/.0656  
Ontario. Dept. of Economics and  
Ontario economic review

May/Jun		1970
gmwg	c.1	BAS





DEPARTMENT OF TREASURY  
AND ECONOMICS  
JUN 4 1970  
POLICY PLANNING  
DIVISION





# Ontario Economic Review

---

**July/August 1970**  
**Volume 8, Number 4**

**Department of Treasury and Economics**

**Hon. Charles S. MacNaughton, Treasurer of Ontario  
and Minister of Economics**

**H. Ian Macdonald, Deputy Minister**

---

HA  
747  
.0656

1970  
Jul/Aug  
c.1 BAS



# Ontario Economic Review

July/August 1970  
Volume 8, Number 4

## U.K. Tax Cuts to Combat Inflation

1

R. G. Holloway, *Economist*  
Department of Treasury and Economics

## Design for Development: The Toronto-Centred Region

3

Regional Development Branch  
Department of Treasury and Economics

## Selected Economic Indicators

14

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. Charles S. MacNaughton  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

### About the Review

The feature article for the July/August edition of the *Ontario Economic Review* presents the first in a series of regional development reports under the Provincial Government's Design for Development Program. As implied by the title, this report on the Toronto-Centred Region provides the basic concept for the comprehensive development of an area within an arc extending 90 miles from Toronto.

This report is based upon a foundation of extensive and intensive research. A substantial contribution was made by the earlier Metropolitan Toronto and Region Transportation Study and by both public and private reactions to a published volume of that study, *Choices for a Growing Region*, released in June 1968. The report is also based on important suggestions from the five Regional Development Councils and the five Regional Advisory Boards within the broad area. Many of the Provincial Government Departments and Agencies have also contributed substantially. The final report was co-ordinated by the Regional Development Branch of the Department of Treasury and Economics under the general supervision of the Interdepartmental Advisory Committee on Regional Development.

In a short article on the recently announced United Kingdom tax cuts, R. G. Holloway of the Taxation and Fiscal Policy Branch, Department of Treasury and Economics examines some of the links between the high rates of U.K. taxation and inflation and outlines possible consequences of the proposed reductions.

### Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



# U.K. Tax Cuts to Combat Inflation

R. G. Holloway, *Economist*  
Department of Treasury and Economics

There is nothing new in the theory that very high taxation is inflationary. More than twenty-five years ago the maximum tolerable peacetime burden of taxation was estimated by Colin Clark as 25 per cent of national income and Keynes lent his support to this view.

What is new is the weight of evidence which has accumulated to support this theory. The United Kingdom's experience over the past six years has been one of massive tax increases on a scale unprecedented in peacetime, with the burden of taxation rising from under 40 to over 50 per cent of national income. These massive tax increases have been followed by accelerated inflation. The latest indicators show retail prices rising at an annual rate of 10 per cent — twice the rate of a year ago and three times the rate experienced under the previous Conservative administration — with wage rates rising at an annual rate of 14 per cent.

## Major Factors

Taxation has not been the sole cause of this inflation. Devaluation has been a major factor and a misallocation of resources resulting from misguided industrial location control is probably another. There have also been mistaken monetary policies and there can be no doubt that the Bank of England's support of the gilt-edged market (now abandoned) has been a prime factor. Since there have been many influences at work it is not possible to isolate and quantify the inflationary impact of taxation. There can be little doubt, however, that the new Government is right in its view that the very high taxation of recent years has been inflationary.

The Labour Government had been elected to office in 1964, and again in 1966, largely on the basis of its promise to achieve a higher rate of economic growth which would permit a substantial expansion of public services with no long-term increases in the burden of taxation. The Government was thwarted in this aim by the legacy of a £800 million balance of payments deficit which it inherited from the Tories and by its failure to recognize the necessity for immediate devaluation. The acute need for increased outlays on such items as roads and hospitals and political promises for higher pensions could not be abandoned, however, although the initial explosive increase in expenditure was eventually brought under control.

The massive increase in taxation under the Labour Government is partly illusory,

## U.K. and Ontario Taxes Compared

	U.K. (1969-70)		Ontario (1970-71) <sup>a</sup>	
	£ millions	%	\$ millions	%
Taxes on income	6,575	36.9	1,416	28.5
Health insurance, etc. <sup>b</sup>	2,321	13.0	594	12.0
Import deposits	184	1.0	—	—
Local property taxes <sup>c</sup>	1,709	9.6	1,418	28.5
Other expenditure taxes <sup>d</sup>	6,292	35.3	1,364	27.4
Taxes on capital	762	4.3	177	3.6
<b>TOTAL</b>	<b>17,843<sup>e</sup></b>	<b>100.0</b>	<b>4,968</b>	<b>100.0</b>

<sup>a</sup>Excluding tax revenue retained by the federal government.

<sup>b</sup>Contributions paid by employees may be classified as taxes on income and contributions paid by employers as taxes on expenditure. Employer contributions in Ontario are estimated as \$375 mn.

<sup>c</sup>In the U.K. these are assessed on the annual value of the property and levied on the occupier, except where occupation is by daily or weekly rental. The Ontario tax is assessed on the capital value and levied on the owner. The U.K. tax is therefore a tax on expenditure while the Ontario tax is a tax on capital. However, tax shifting makes the practical difference negligible.

<sup>d</sup>Including vehicle licences and driver permits.

<sup>e</sup>Equivalent to 51% of national income.

however, since much of the increased revenue was transferred back to the private sector, including industry. The taxes paid by corporations rose steeply with the abolition of capital allowances as deductions from taxable income, increases in the rate of corporation tax, and the introduction of redundancy fund payments, industrial training levies and the selective employment tax. However, much of the increased revenue was paid back to industry in the form of rebates, investment and training grants, and regional employment premiums. At the same time there was a net transfer from middle and upper income taxpayers to those with lower incomes and, in addition, a substantial switch in resources from capital formation in the private sector to public expenditure programs. Even where this public expenditure is productive (as in the case of motorways) the pay-back period is substantially longer than for private sector outlays on such items as plant and machinery. Under full or nearly full employment conditions, in the short term, such expenditure is inflationary.

## Adverse Effects

The Labour Government recognized that the taxation of personal incomes had already reached a level where further increases would have adverse effects on incentives but it failed to recognize that higher taxes on profits penalized efficiency and restricted the supply

of capital, both from retained profits and from new equity issues. This situation was worsened in that the investment grants which the Government paid to manufacturing industry were given irrespective of the prospects for profitability. Further, the regional employment premiums probably resulted in a misallocation of resources, particularly if viewed over the short and medium run; while the redundancy fund and increases in social security payments enabled the unemployed to stay out of work longer without the hardship which would previously have been experienced. *bad?*

Part of the burden of the higher taxation of corporate profits (seemingly one-half) was passed on to the consumer in the form of higher prices while the other half has been borne by the shareholder. But most of the burden of the selective employment tax and of the increases in purchase tax and excise duties was passed on in the form of higher prices or of a falling quality of services. Paradoxically, in the short run the effect of these higher taxes was both inflationary and deflationary. They were inflationary in the sense that they increased prices and they were deflationary in the sense that they dampened the growth in the volume of consumer expenditure — thus achieving their intended purpose in releasing resources for export and investment (which, however, remained depressingly low). In the longer



term, however, it has not proved possible to restrain wage demands made to compensate for the rise in prices, and the consequent rise in the volume of consumer expenditure has imposed an inflationary strain on resources.

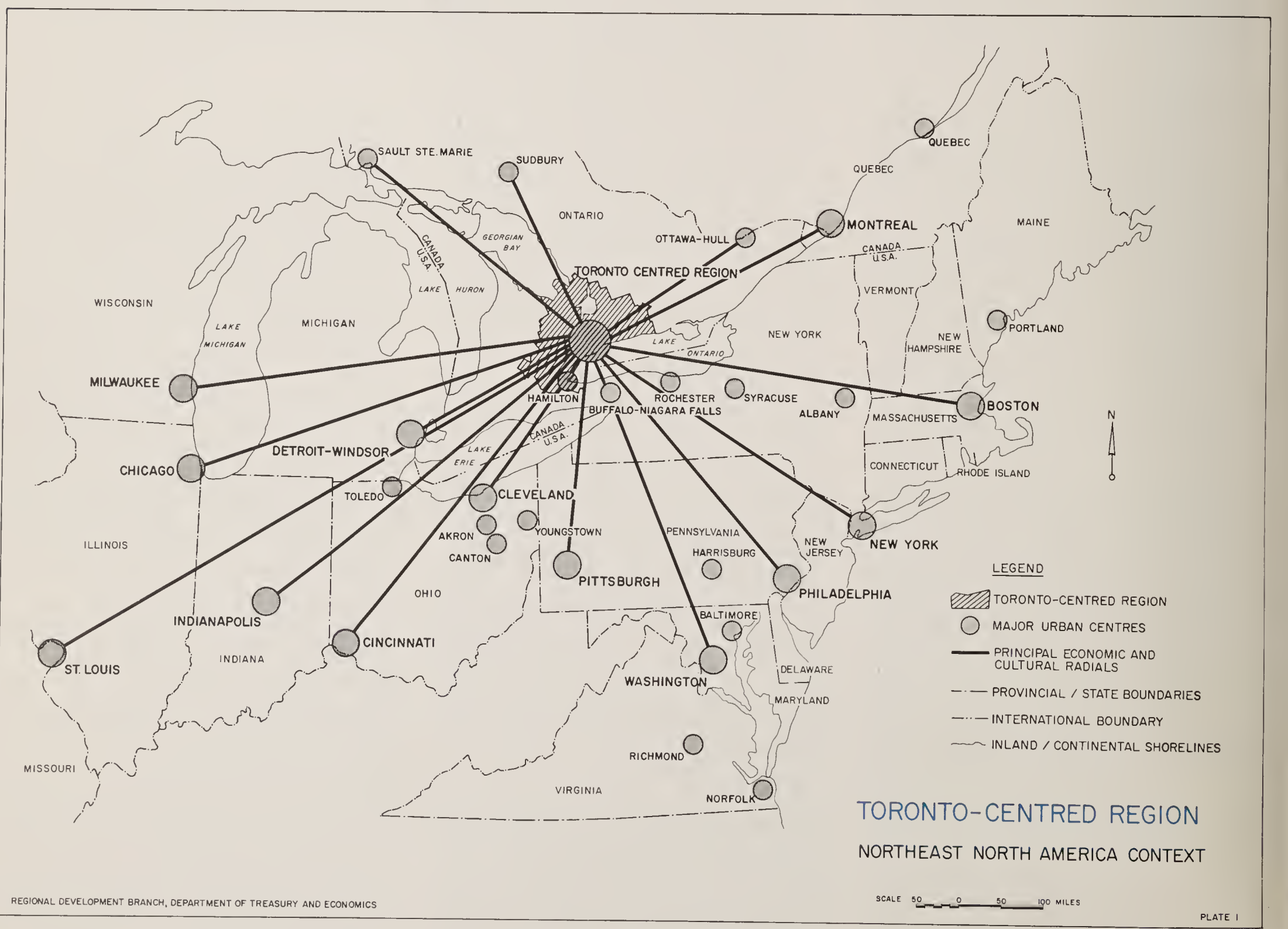
Promised Cuts

The Conservative Government has announced that it intends to cut taxes to combat inflation. The details of these cuts have not yet been announced but past policy statements indicate that the new administration appreciates both the inflationary effect of direct taxes through incentives and the inflationary effect of indirect taxes through wage demands, with secondary effects in each case. The Conservative policy is essentially

to cut the burden of direct taxes to improve incentives. It is also hoped that the resulting expansion of demand will lead to increased investment and productivity growth. If the short term impact on imports and the diversion from exports can be borne, this hope may very well be fulfilled. This is a big "if".

It is clear that the Conservative Government wishes to cut the standard rate of personal income tax and to lower the surtax which is imposed on those with substantial incomes. The Conservatives have also promised to modify the capital gains tax (an action which should improve the supply of savings) and they also intend to abolish the investment grants and regional employment premiums, thus permitting a cut in corporate

taxation. They have also promised to abolish the selective employment tax, though this probably means converting it into a general payroll tax or absorbing it in the value added tax which has also been promised. The evidence on the effect of a value added tax on prices is not conclusive but it appears that the short-term effect is inflationary while the longer-term effect is greater efficiency, resulting in enhanced growth — more than would be achieved through raising the same amount of revenue by taxing profits. A further reduction in the burden of the British taxpayer can be anticipated from the promised abolition of farming subsidies and the substitution of an import levy on food — a levy which must in part be borne by foreigners, notably including Canadians.





# Design for Development: The Toronto-Centred Region

Regional Development Branch  
Department of Treasury and Economics

## INTRODUCTION

The approach toward a development concept for the Toronto-Centred Region began in December, 1962, when the Government of Ontario issued an Order-in-Council establishing the Metropolitan Toronto and Region Transportation Study, (MTARTS). In June 1968, the final report was officially released. Volume 2 of the MTARTS Study, *Choices for a Growing Region*, was a study of alternatives for the emerging development pattern.

The Government then requested public and private briefs so that an acceptable regional plan could be made. This process overlapped the province-wide planning, on a regional basis, that had already begun with the announcement of *Design for Development* in April 1966. An interdepartmental Goals Planning Committee was established to evaluate the incoming briefs and alternative Goals Plans set out in the MTARTS report.

In October 1969, the MTARTS study was enlarged and the new area was entitled the Toronto-Centred Region. Although the MTARTS study area was suitable for transportation planning, it was not entirely appropriate for regional planning. The added portion forms an arc outside the old MTARTS area, and includes Kitchener-Waterloo, Brantford, Midland, Peterborough, and recreation districts to the north and north-east.

## Purposes of the Report

The purposes of this report are to establish the Development Concept as a guideline to be followed in all government decisions having an effect on the Region, and to provide a basis for public reaction as to how the Regional Development Concept can be carried out and how the broad proposals contained in it can be made more specific.

The section on Regional Development Perspective places the Region in the economic, social, and geographic context of north-eastern North America, Canada, and the Province of Ontario. The geographic structure and dynamic interrelationship of the Region with its Metropolitan core are described. The physical features which exert the predominant influences on the Region's shape are discussed. Finally, the changing parameters of development in the region are listed.

Five fundamental planning principles and twelve basic goals, all of which have been adopted as guides for decision in aiming at conclusions, are listed and explained.

Trends of the Region's past and current growth are described and evaluated against these principles and goals to yield a statement of present major inadequacies and future problems of such trends.

Finally, the focal points of future development policy are discussed along with the fundamental reasons for each. The urban pattern is stressed, with special attention to the Lake Ontario urbanized area and the potential for urban development elsewhere in the Region. Basic guidelines for regional land use are given. The special role of transportation is pointed out.

## SUMMARY OF FINDINGS AND POLICY RECOMMENDATIONS

The Toronto-Centred Region's population is expected to reach the neighbourhood of 8 million by the year 2000, compared with 3.6 million in 1966.

Increases in family income, mobility and leisure time will make the Region more accessible and more extensively used. The Region will continue to grow as part of the Chicago-Detroit-Toronto-Montreal megalopolis and as the financial, manufacturing, cultural and communications centre of Canada and especially of Ontario.

*Within the Region* growth is increasingly concentrating in the metropolitan core and towards the west and south-west. There is only modest growth to the north and east — even in those places which have the capacity to attract their own residents and commuters and thus reduce congestion elsewhere.

From an *urban perspective*, growth is "suburbanizing" predominantly westward in a pattern that contains aspects of unstructured sprawl. Within the commuting area surrounding Metropolitan Toronto, quantities of land are being removed prematurely from agricultural and recreational use both for low density residential purposes and for speculation.

In the *peripheral belt*, which has a special recreation relationship to the urban population of the Lake Ontario urban corridor, summer residences are taking up sizable quantities of land, particularly along the lakefronts.

The problems of such trends, if they are not properly structured, can be broadly grouped as follows:

*Massive Urbanization, Congestion:* Difficulties in environment, housing, traffic, recreation, urban design and access to and from the hinterland.

*Urban Form:* Inefficiencies in the provision of flexible, least-cost, high-performance trunk services, such as transportation and water and sewer.

*Region's Space and Resources:* Insufficient use of districts with good development potential, but beyond easy commuting range of Metropolitan Toronto.

*Provincial Integration:* Detraction from effective integration of the northern and eastern parts of the Province with the Toronto-Centred Region because of the strong thrust to the west and southwest from Metropolitan Toronto.

*Regional Environment:* Misallocation of prime recreation and agricultural areas.

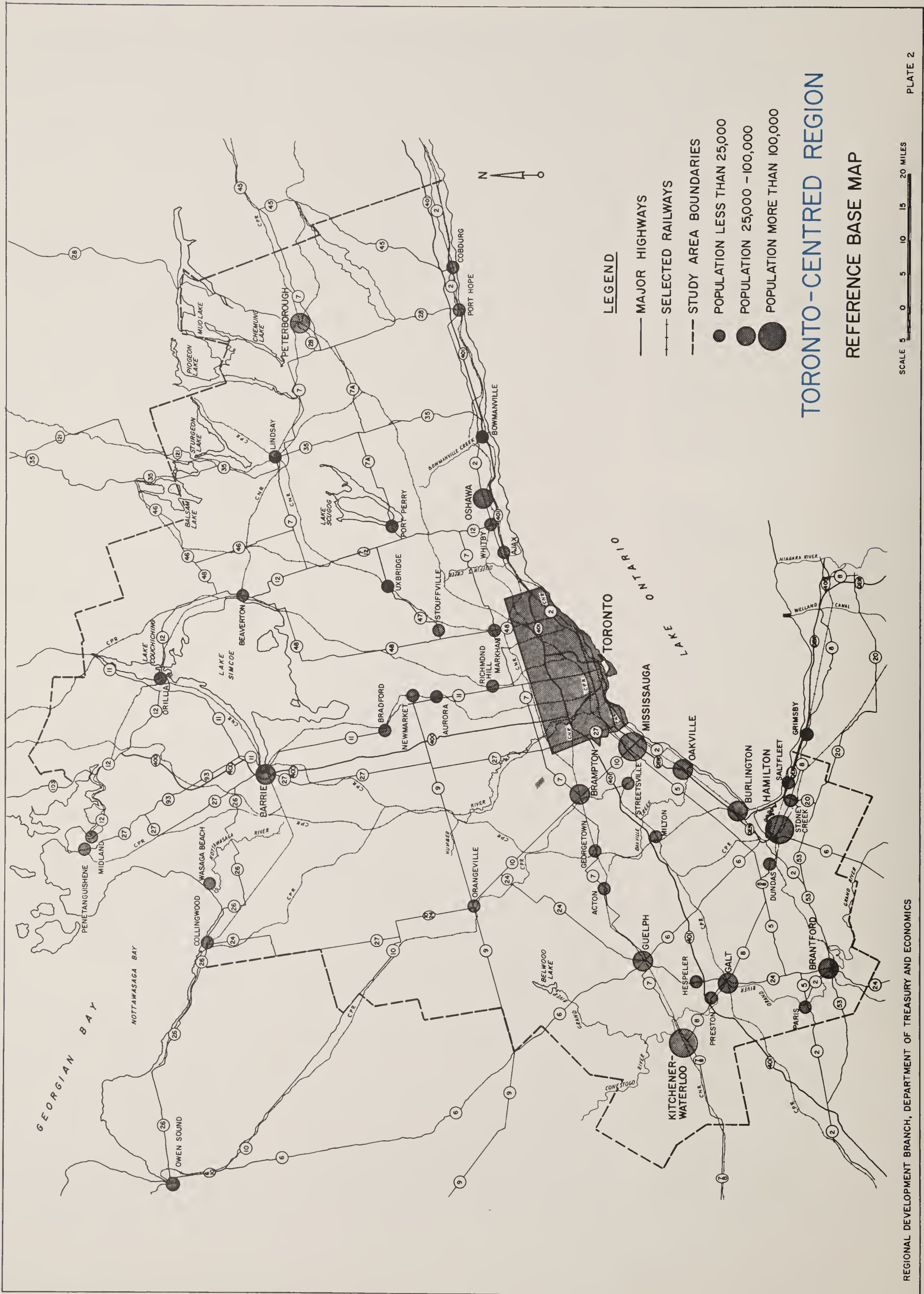
The main purposes of the Toronto-Centred Region Development Concept are to: (1) shape the growth of the Region's metropolitan core into a two-tiered urbanized area, (2) encourage growth in selected communities beyond easy commuting range of Metropolitan Toronto, and thus help to decentralize the Region and prevent a swollen growth within and near Metropolitan Toronto, and (3) set basic guidelines for regional land use. Of the Region's expected population of nearly 8 million people, 5.7 million, or 71 per cent are targeted for the lakeshore urbanized area; 300,000, or 4 per cent for the adjacent commuting zone, and 2.0 million or 25 per cent for the peripheral belt. (These are shown as zone 1, 2 and 3, respectively, in Plate 3.) The key points of future development policy are:

Develop a well-structured, urbanized zone from Bowmanville to Hamilton for a population of approximately 5.7 million by the year 2000, the structure to be basically a two-tiered arrangement of cities separated by a parkway belt of open space with mainly non-urban uses, but containing high-performance inter-urban transportation and other trunk services. Stimulate the eastern corridor to a higher growth rate.

Encourage growth in key places to the north (such as Barrie and Midland) and the east (such as Port Hope and Cobourg) where there already exists an unused potential for development. If so encouraged, such places will attract their own daily commuters and thus will reduce commuting congestion to and from Toronto.

Try to resolve the growth problem of the Kitchener-Waterloo-Galt-Preston-Guelph area without drawing upon it to







make room for growth touched off by Toronto.

Reserve sizable districts northeast and northwest of Metropolitan Toronto for open space, conservation areas, recreation and agriculture.

Carefully encourage selected communities along the northern route between Metropolitan Toronto and Barrie (Richmond Hill, Aurora, Newmarket) using existing and prospective public facilities.

Maintain the Georgian Bay shoreline, Lake Simcoe, Kawartha Lakes and the Niagara Escarpment as well as parts of the Lake Ontario shoreline, for conservation and recreation uses for the expanding population.

Develop a transportation pattern to provide the best possible service for all parts of the Region as envisaged in this Concept.

## THE REGIONAL DEVELOPMENT PERSPECTIVE

Development of the Toronto-Centred Region must consider: (1) the overall economic, social and geographic context in which the Region grows, (2) the geographic structure and dynamic interrelationships between the Region and the Metropolitan Toronto regional core, (3) the physical features which constrain and shape the Region's growth, and (4) the changing conditions of regional development, which continually alter the relationship of population to space.

### The International, National, and Provincial Context

The first perspective of regional development in the Toronto-Centred Region is the international, national, and provincial context.

The development of the Region obviously is greatly dependent upon the role of the Region in the Northeastern quadrant of North America, in Canada and in the Province of Ontario.

- a) The Toronto-Centred Region is strongly influenced by surrounding major metropolitan centres of Northeast North America — New York, Boston, Detroit, Chicago, St. Louis, Montreal. The market within 500 miles includes 90 million people. (see Plate 1).
- b) The Region is in close proximity, and has strong economic linkages, to the heartland of American industry, which is found in the Chicago-St. Louis-Cincinnati-Cleveland quadrilateral and reaches

eastward, in both Canada and the United States, to such leading seaports as Montreal and New York.

- c) With increasing economic interdependence, these linkages have stimulated a development corridor between Chicago and Montreal (the Great Lakes-St. Lawrence Megalopolis) of which the Toronto-Centred Region is a major sector.
- d) Because of the location within the Great Lakes-St. Lawrence Megalopolis, the Toronto-Centred Region probably can increase its economic role in processing resources which currently originate in Northern Ontario, and move to major markets in the Chicago-Detroit-Cleveland industrial area.
- e) This Region performs a leading manufacturing, financial, and cultural role in Canada. The manufacturing predominance is partly a result of the adjacent location to American firms with branch plants producing for the Canadian market. Metropolitan Toronto is a focus of cultural and financial leadership in meeting national aspirations. It also is a national communications centre.
- f) The primacy of the Region in the Province's economic, social and cultural life needs no elaboration. The Region accommodated 3.6 million of the Province's 6.96 million people in 1966. This was 52 per cent of the total, and the proportion is still rising.
- g) The inequity of opportunity and income between the Toronto-Centred Region and the Georgian Bay, Northeastern and Eastern Ontario regions, is one of the Province's most critical development problems.

### Geographic and Functional Structure of the Region

The Region is shown on Plate 2. The second perspective is the set of geographic and functional interrelationships among (a) the lakeshore urbanized area, (b) the commutershed, and (c) the peripheral zone.

- a) The *lakeshore urbanized* area is that zone which encompasses the Metropolitan core itself, plus reasonably adjacent urban settlement. On Plate 3, this is shown as Zone 1.
- b) The *commutershed* is that zone beyond the lakeshore urbanized area but within easy daily commuting range of employment in Toronto. On Plate 3, this is shown as Zone 2.

- c) The *peripheral zone* is that belt beyond the commutershed which is still well within the orbit of highly specialized influences of the Metropolitan core. Its economy is tied to the Region's core, and it acts as open space and recreation territory for the urban population. On Plate 3, this is shown as Zone 3.

In this three-zone geographic breakdown shown on Plate 3, the actual boundary lines are drawn to reflect improvements in transportation and continued mass urban development along the Lake Ontario shore.

The highlights of the functional interrelationships of these zones in the Toronto-Centred Region are as follows:

- a) The southwestern districts of Zone 3 are well developed, with urban places functionally tied to the Metropolitan Toronto core.
- b) The northern and northeastern districts of Zone 3 now have a special recreational relationship to the population of Metropolitan Toronto, but offer promise of urban development.

### Physical Features which Shape the Region

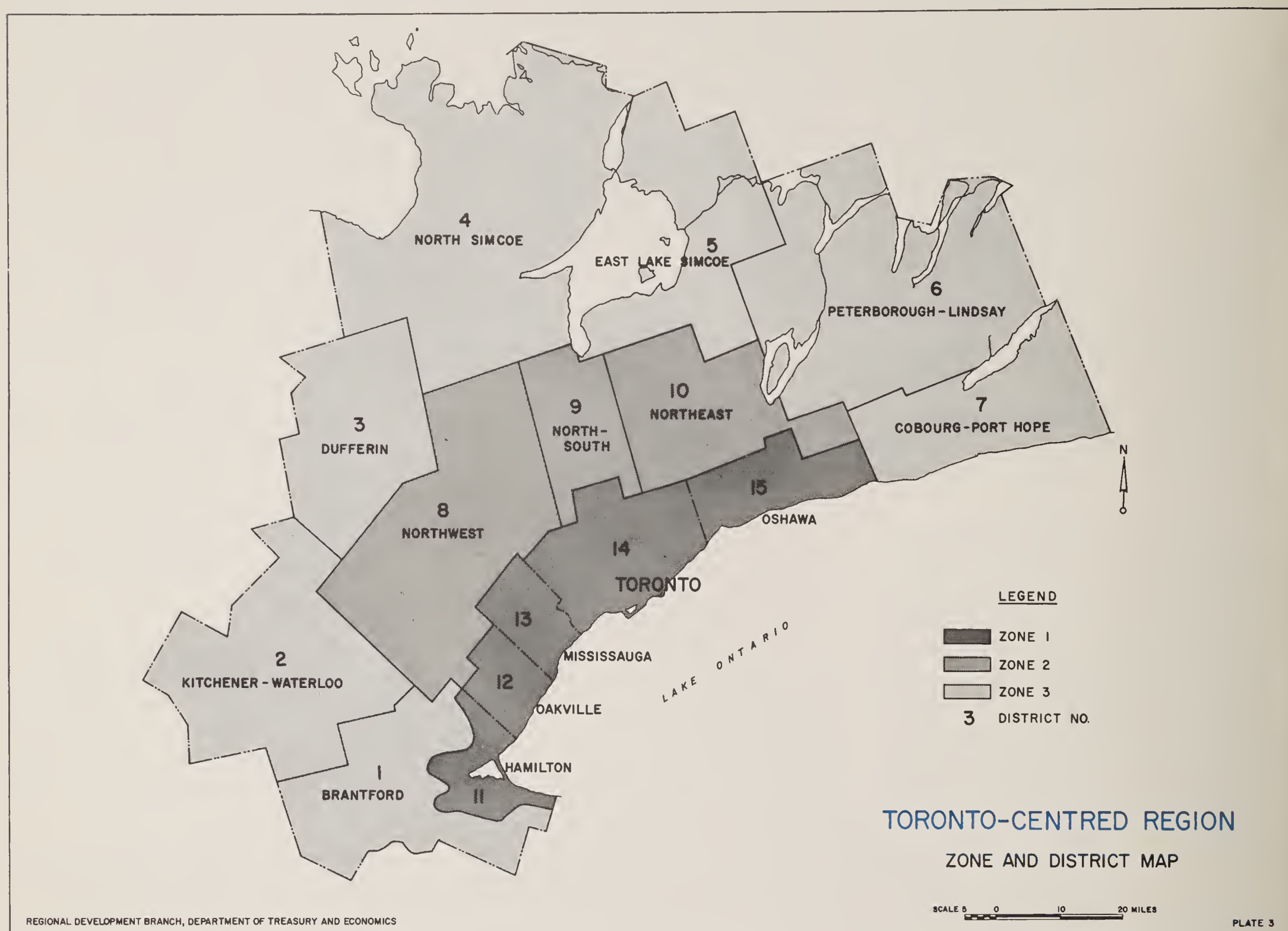
Very prominent physical features set the northern, eastern and southern boundaries:

- a) The shape of the land area of southwestern Ontario, and its two-point connection to the American land mass exert a very strong westward attraction in the direction of development.
- b) The Georgian Bay shoreline and the edge of the Canadian Shield provide a physical border to development in the north and northeast.
- c) In the eastern part of the Region, the Canadian Shield forces development into a narrow neck of land along Lake Ontario.
- d) The location of the Region and Metropolitan Toronto on a more or less straight shoreline limits development to a semicircular arc.

Physical features shape regional growth by acting either as constraints or attractions to development.

- a) The high quality agricultural land which is predominantly to the west of Metropolitan Toronto was the earliest attraction and therefore set historical development patterns.
- b) The location of Lake Simcoe makes Simcoe County a natural transportation corridor to Northern Ontario.





- c) The interior watersheds do not have extremely large rivers to tap for water supplies and to carry treated sewage effluent, thus limiting the location of larger urban centres to the Lake Ontario Shore or to Georgian Bay, rather than the interior.
- d) The scenic and recreational assets of the Niagara Escarpment, Lake Simcoe, the Georgian Bay shore and the Kawartha Lakes naturally restrict their use for urban purposes.

#### Changing Regional Development Conditions

Population growth in the Toronto-Centred Region is expected to continue at a high rate. From a 1966 base of 3.6 million, the population is expected to reach close to 5 million

by 1981 and nearly 8 million by the year 2000. The relationship of the population to the Region's resources and space will be altered by three types of change:

- a) Family incomes are expected to triple by the end of the century, and approach \$15,000 per family (at today's price levels).
- b) Leisure time is expected to increase with the possibilities of the considerably shorter work week and longer vacation.
- c) Mobility will be considerably greater.

The major influences associated with these changing conditions are higher education levels and technological innovation.

These changes can be expected to manifest themselves in greater per capita space requirements both within the urban centres

and in the rest of the Region, especially in recreation areas. Increase can be anticipated in residential and transportation space per capita and in employment space per employee.

These and related changes must be anticipated and planned for. As applied to Toronto, such planning can be expected to be applicable to an ever-widening area. Only 35 years ago, the City of Toronto and the older suburban towns encompassed less than 100 square miles. When Metropolitan Toronto was formed in the mid-1950's, the administrative area was 240 square miles and the planning area more than 700 square miles. But the MTARTS planning area was about 3,200 square miles, and the Toronto-Centred Region encompasses 8,600 square



miles for prime impact, while the interaction area comes to about 15,000 square miles.

## PRINCIPLES OF DEVELOPMENT AND SELECTED REGIONAL GOALS

A set of regional goals was adopted to assess present growth trends and plan the Region according to a basic set of values. As a result, five basic principles were developed.

### Development Principles

The development concept rests on five basic principles, each of which relates both to current and future conditions:

1. The principle of *linearity*, which seeks as far as possible to align urban places along a series of more or less straight paths to take maximum advantage of parallel routes for transportation and services.
2. The principle of *functional efficiency*, which seeks a best set of political, economic, and social relationships for all urban and rural places.
3. The principle of *decentralization*, which emphasizes (a) the importance of metropolitan centre influence, and (b) a logical distribution of urban places within a metropolitan region, with special attention to the encouragement of smaller centres which functionally are related to the metropolitan region, but geographically are located beyond easy commuter range to the metropolitan centre.
4. The principle of *space conservation*, which stresses, on a per capita basis, adequate open space and recreational requirements.
5. The principal of *natural resource conservation*, which stresses the need for careful use of land, water and air.

### Goals for the Region

Each of the following 12 goals has social implications, although these are mentioned specifically only in Goal 11. In accordance with the recommendations of our internal committee working on the Report, the vital social implications are to be considered in conjunction with all twelve goals. The goals are:

1. To facilitate the achievement of the Region's economic potential, consistent with the overall provincial interest and development.
2. To preserve the unique attributes of the regional landscape.

3. To minimize the urban use of productive agricultural land.
4. To minimize the pollution of water and the atmosphere.
5. To facilitate and maintain a pattern of identifiable communities.
6. To provide best possible accessibility for the movement of people and goods.
7. To provide essential transportation, water and sewer facilities at minimum cost consistent with overall benefit.
8. To maximize opportunities for using specialized services and facilities.
9. To develop in a manner consistent with the needs arising from long-term population trends, particularly in scale of growth and anticipated changes in household size and composition, and in age distribution.
10. To develop in a manner consistent with emerging and probable future technological innovations, i.e. to facilitate, adjust to, and receive the benefits of such possibilities.
11. To develop in a manner consistent with the needs arising from social changes resulting from future economic and technological developments, e.g. changing patterns of leisure.
12. To develop the Region in a manner that provides flexibility.

## TREND PATTERNS AND INHERENT PROBLEMS

### The Pattern of Trends

The pattern for the Toronto-Centred Region reflects a process guided by present and past public policies — in effect, unco-ordinated public policy. The predominant trends are as follows:

1. From a regional perspective, growth is concentrating at the Region's core, i.e. Metropolitan Toronto.
2. From an urban perspective, growth is "suburbanizing" into patterns with aspects of unstructured sprawl, with considerable intensity along the major transportation axes, and infilling of low density sprawl between these axes. Sprawl tends to be westward, toward the developed south-western part of the Province. Coincident with this process is the continued intensification of high rise developments close to the Toronto central business district and other urban focal points.
3. In the commutershed, especially toward the north-west, the country resident who is employed in Toronto is taking up large

tracts of land. This practice is removing from use large quantities of prime agricultural and recreational lands.

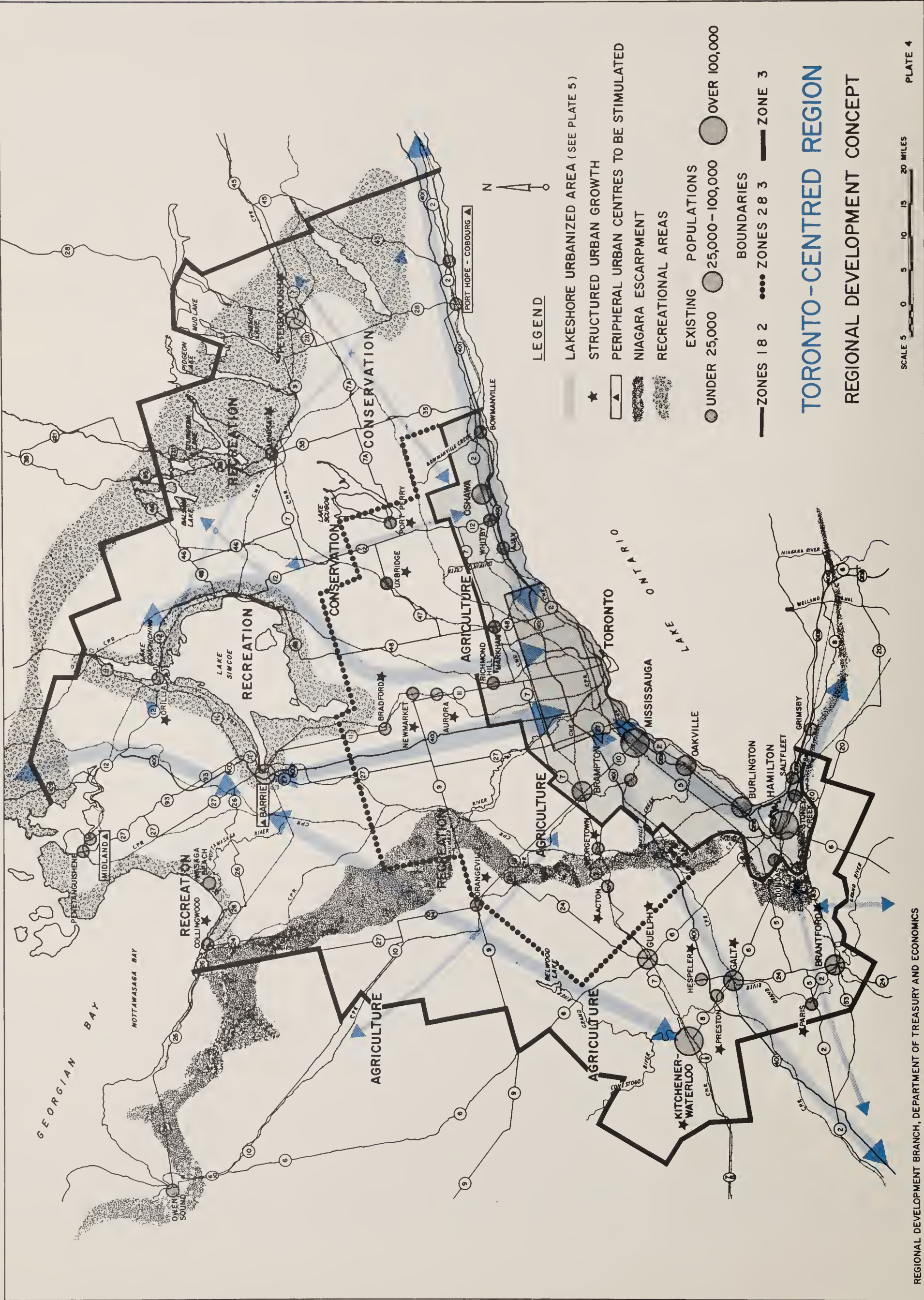
4. The peripheral areas are growing at a very modest pace in the eastern, north-eastern and northern segments of the peripheral arc. But along the western peripheral segment, especially around Kitchener-Waterloo, there is considerable growth in an area which will be difficult to provide adequately with sewer and water facilities.
5. Summer residences are taking up large areas of land in recreation areas, particularly along lakefronts.

### Emerging Problems of Trends

The major trends problems and their implications can be categorized as: (1) those relating to extensive urbanization; (2) those related to the urban form created by aspects of unstructured sprawl; (3) those related to the inadequate use of districts with high development potential; (4) those related to the lack of provincial integration; (5) those related to the misallocation, misuse and consequent damage to non-renewable regional resources.

1. Some problems of extensive urbanization are those of pollution, bad housing, traffic congestion, lack of recreation, unsuitable urban design, poor access to and from the hinterland and sheer lack of space. The problems of Metropolitan Toronto stem especially from the high rate of population growth of an already densely populated area. The basic problems are:
  - a) The shortage of land for housing is acute; and, together with capital shortage, has priced home ownership beyond the reach of a large proportion of the population. This has led to disruption of otherwise stable neighbourhoods and a deteriorating residential environment near the heart of the metropolis.
  - b) Industrial land also is in increasingly short supply in some areas.
  - c) In parts of Metropolitan Toronto, the local street system is rapidly becoming obsolete because of an increasing number of high density developments.
  - d) The tremendous increase in people adds to the cost of streets — both in upkeep and expansion. Expensive basic facilities in good condition become inadequate and must be renewed prematurely.







- e) Requirements for the so-called soft services, such as education, are becoming harder to meet.
  - f) Extension and improvement of public parks and open spaces become difficult.
2. The problems associated with the urban form of unstructured westward sprawl are sheer inefficiencies in the provision of economic, adequate transportation and service networks.
    - a) The westward thrust of growth is not offset, at least in part, by an active eastward growth. This makes a transit system difficult to operate, by requiring high-capacity facilities which are not needed throughout the system.
    - b) Radial development, when the routes are widely separated, makes it difficult to put an optimum population within reach of high performance transit, water and sewer services.
    - c) Unstructured sprawl, where it exists, can create costly road and service systems, and reduce the choice of transportation means, thereby decreasing efficiency.
  3. Inadequate use of the Region's space and resources results in lost opportunities and difficulties in long-term growth.
    - a) Transportation could be more economically utilized if traffic flows occurred more evenly and rail lines were used to higher capacity.
    - b) Some outlying locations offer better access to the more charming parts of the Region. Settlement there would reduce the recreation traffic since these residents would not live in Metropolitan Toronto. This in turn would improve hinterland access to those who do live along the Lake Ontario shore.
  4. Current trends do not foster provincial integration in either the geographic, social, or economic sense. Just the opposite; such trends, concentrating in the Region's core and thrusting west, reinforce existing strong linkages among the well-developed south-western parts of the Province, but do little to strengthen the linkages and ties with Northern or Eastern Ontario.
    - a) The possibility of greater interaction between the Toronto-Centred Region's skills and markets and Northern Ontario's resources becomes more

remote as does the connection with the Eastern Ontario economy. The northern and eastern areas of Ontario, therefore, simply are not stimulated to further growth by the structure of the Toronto-Centred Region

- b) The trend pattern does not move growth into areas of low income, which lie north and east.
- c) Socially, the relationships between Northern Ontario, Eastern Ontario and the Toronto-Centred Region become weakened, reducing the overall sense of provincial identity.

### **FOCAL POINTS OF DEVELOPMENT POLICY FOR THE TORONTO-CENTRED REGION**

The general guidelines presented here are designed to help overcome the emerging problems of trends, fulfil the goals as much as possible, and be consistent with the principles of development (Plate 4). As mentioned previously, implementation of this seven-point program is expected to be accompanied by a relative shift of population. Whereas in 1966, 75.6 per cent of the population was in the Lakeshore urbanized area (Zone 1), 4.5 per cent in the commutershed (Zone 2), and 19.9 per cent in the periphery (Zone 3), by the year 2000 the relative distribution is expected to be approximately 71 per cent, 4 per cent and 25 per cent, respectively.

Of the seven points in our program, the first five relate to the individual zones, whereas the last two apply to the Region as a whole.

1. Develop a well structured urbanized area (Zone 1) along the Lake Ontario shore from Bowmanville to Hamilton.
2. In the peripheral zone (Zone 3) develop such urban areas of reasonably significant size as Barrie and Midland in the North Simcoe district, and another at, or in the vicinity of, Port Hope-Cobourg. This reflects the conviction that decentralization of high growth from Metropolitan Toronto must begin soon and that these are appropriate places to encourage new growth.
3. Also in the peripheral zone, determine the roles of the Kitchener-Waterloo-Guelph-Galt urban cluster and of other key urban places, and resolve the current physical development constraints.
4. Within the commutershed (Zone 2) adopt a policy of retaining land as much

as possible for recreation and agricultural and open space uses. This policy would concentrate limited growth mainly within existing communities.

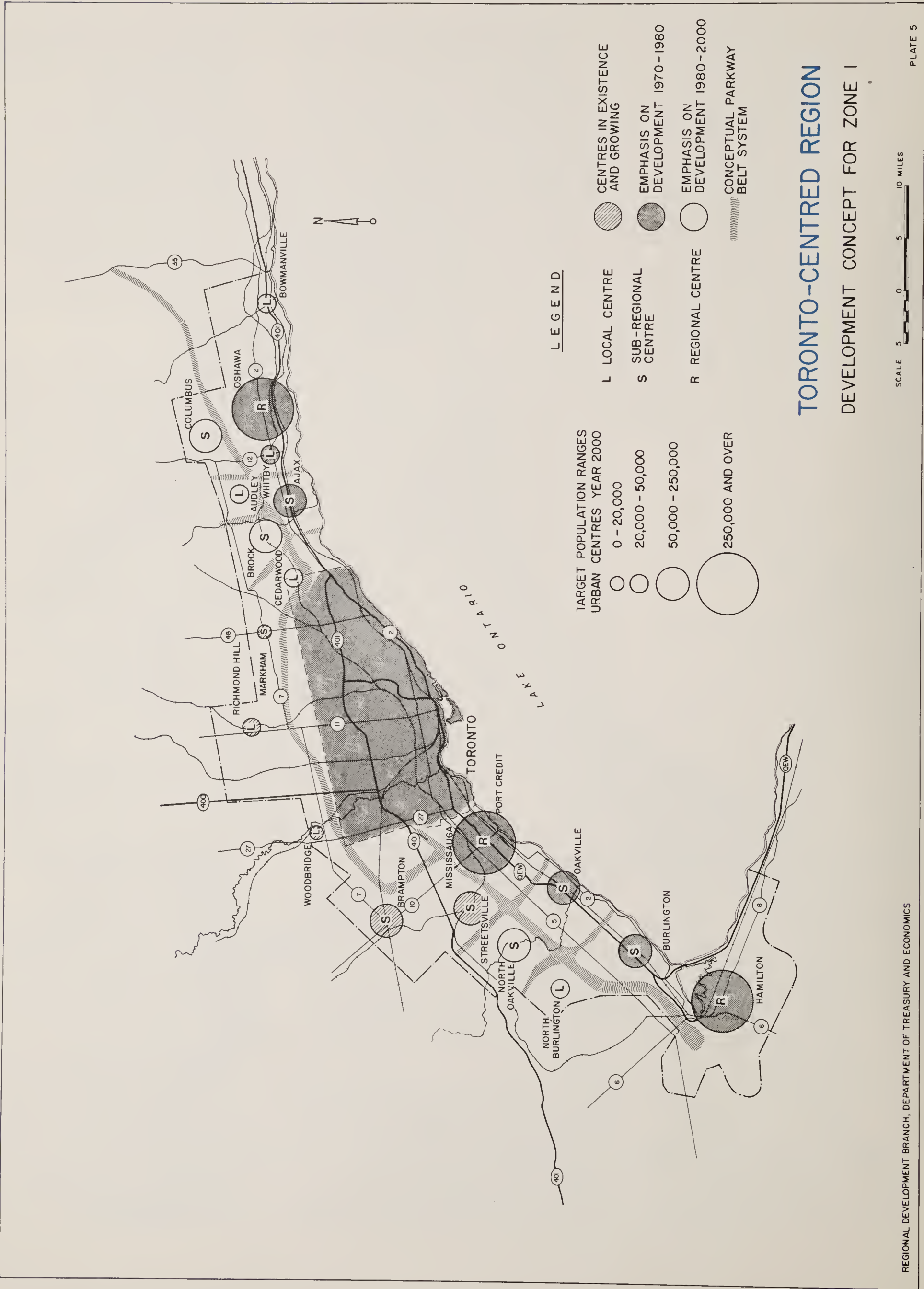
5. However, also within Zone 2, develop a small urban axis north of Metropolitan Toronto towards Barrie.
6. Maintain the Georgian Bay shore, Lake Simcoe, the Kawartha Lakes, the Niagara Escarpment, valley systems of the commutershed, and other key places as recreation and open space areas.
7. Create a transportation plan that will articulate the proposed Development Concept.

### **The Lake Ontario Urbanized Area (Zone 1)**

The Development Concept for the Lakeshore Urbanized Area from Bowmanville to Hamilton is a modification of Goals Plan II of the Metropolitan Toronto and Region Transportation Study (see Plate 5). Zone 1 is expected to accommodate 5.7 million of the Region's 8 million people by the year 2000. Of this number, approximately 3.1 million are expected to be in Metropolitan Toronto and its immediate northern fringe, 1,850,000 are expected to be west of Metropolitan Toronto, and 750,000 east of Metropolitan Toronto. This calls for a considerable shift within Zone 1 both east and west from the Metropolitan area.

1. The urban centres are arranged in a linear urbanized area from Bowmanville to Hamilton.
2. The eastern portion of this area, extending from the boundary of Metropolitan Toronto to Bowmanville, is to be stimulated.
3. The structure is to be basically a two-tiered arrangement of cities in both the eastern and western parts of the urbanized area.
4. Hamilton and Oshawa-Columbus are projected as the major terminal cities, especially for mass transit. These will act as regional centres to promote economic and social identification and efficiency.
5. Urban centres of the urbanized area are to be separated by a Parkway Belt system of mainly non-urban uses, and at the same time connected by a regional transportation network. This would connect the cities, and be comprised of facilities incorporated into the Parkway Belt. The water supply and sewage disposal systems would be lake-oriented.







The choice of a linear urbanized area of distinct urban centres, as opposed to a radial spread, emphasizes the need for: (a) a highly integrated transportation system at reasonable cost, and (b) a low-cost, efficient, non-polluting water and sewer-servicing scheme. The linear arrangement would generate sufficient traffic to make workable a highly sophisticated transit system, compared with the less desirable, somewhat unbalanced, automobile-oriented traffic system normally accompanying trends. The linear urbanized area, arranged along the Lake Ontario shore, provides substantial economies in services. If the trend pattern continues, settlement will move into areas off the lakeshore. These areas do not possess major rivers which could be used for water supply and which could carry treated sewage effluent without damage. Such settlement would require long water and sewage piping. Similar economies may be possible in the future extension of hydro transmission lines, whether above or below ground.

The stimulation of the eastern urban corridor, from Metropolitan Toronto to Bowmanville, is based on increasing efficiency in the transportation system, developing large quantities of land for all purposes such as housing, making better use of the Lake Ontario waterfront, helping less prosperous parts of the Province, and bringing populations closer to the recreation lands recommended for the eastern shore of Lake Simcoe, the Kawartha Lakes and further north. The problem of opening up enough land for the desired low-density housing simply cannot be met through exclusively westward development.

The two-tiered arrangement, as opposed to the single-tiered arrangement, is related to the need for two transportation corridors. One reason is that a single corridor would be overloaded. A second is the need to tie the urban growth into recognizable communities within a workable urban hierarchy. The design of each of the urban centres would try to link the location of the central business district and high-density housing to the regional transportation system. For the upper-tier cities, particularly, these two components would be placed adjacent to the Parkway Belt within which the transportation system operates. This is generally consistent with the concept of community structure as expressed in *Choices for a Growing Region*.

Regional centre roles are expected for Oshawa and Hamilton. These two would also be the terminal cities for mass transit. These

two centres would exert sufficient force through social, cultural, employment and government activities to reduce peak-hour traffic to and from Toronto in the corridors. Other urban centres to the east, west, and north have been assigned lesser roles. In essence, the structure is designed to offer a variety of types of urban centres, both by function and size.

The vital and unifying organ of the entire system is the Parkway Belt. This is a multi-purpose service system which would incorporate many kinds of transportation, pipelines and electrical power lines, water and sewer lines, where applicable, with open space added. It would reduce the number of separate swaths cutting through future urban communities. Defined open space would provide trails joining intersecting ravines and the abutting parks, a buffer against traffic noise, room for selected low-density public facilities, and respite from the frustrations caused by continuous urbanization. The essentials are that it would include as many parallel transportation facilities, servicing and energy facilities (pipelines as well as electrical) as possible, and at the same time provide the greatest degree of flexibility for the future.

The Zone 1 concept presented here does not deal at any length with the location of sub-regional centres and related transportation corridors within Metropolitan Toronto. However, care has been taken to ascertain that the Concept here presented relates to plans being developed within Metropolitan Toronto.

### **The Peripheral Zone (Zone 3)**

Recommended policy for the peripheral zone (Zone 3) is similar to that in Zone 1. This policy depends heavily upon encouragement of economic activity in the north and east, and encouragement of only modest growth in the west. It is expected that, by the year 2000, a population of 2 million people will be living in Zone 3. This will amount to a 25 per cent share of overall regional population.

Development of the North Simcoe and Port Hope-Cobourg Districts:

From the northern and eastern segments of Zone 3, the Development Concept recommends:

1. Encouragement of the development of such centres as Barrie and Midland from 1970 to the year 2000 and beyond;

2. Development of a very significant peripheral urban centre in the Port Hope-Cobourg vicinity after 1980.

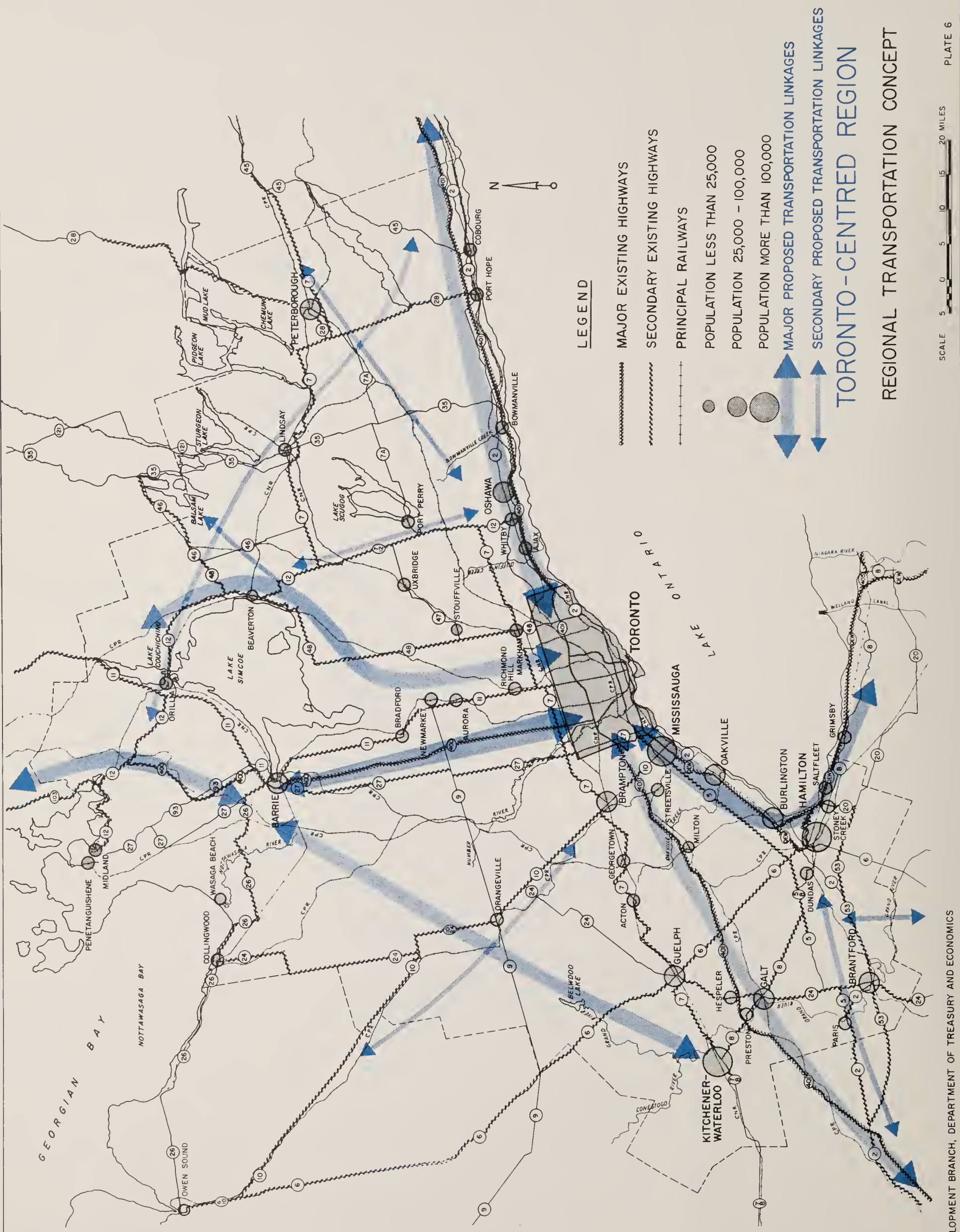
The reasons for the choice of these two areas are as follows:

1. The problems associated with mass urbanization can be eased by application of the principle of decentralization to encourage centres which are beyond easy commuting range of, but function within, the economic orbit of Metropolitan Toronto.
2. Over-concentration of development within the commuting range (Zones 1 and 2), does not make effective use of the Region's space and resources. Thus, at present, there is an unsatisfactory distribution of population in the Region.
3. The goal of provincial integration of the Toronto-Centred Region into an overall provincial development network would be partially realized. If enlarged, urban centres such as Barrie and Midland could provide closer ties to Northern Ontario. A more dynamic Port Hope-Cobourg nucleus could become a springboard to Eastern Ontario. All of these centres are on major transportation routes and should therefore be attractive to some industrial development.
4. Substantial progress also would be made towards the goal of encouraging each part of the Toronto-Centred Region to achieve its potential. The Georgian Bay Region currently is the least prosperous in the Province, and average incomes in Eastern Ontario also are generally below those of the Province. In contrast, income levels within Metropolitan Toronto and its immediate suburbs are the highest in the Province. Stimulation of key urban centres to the north and east should partially offset these inequities.
5. The North Simcoe and Port Hope-Cobourg districts possess physical capability for large-scale urban development. The provision of water supply and sewage disposal facilities to these urbanized areas can be at a cost comparable with, and possibly cheaper than, costs for similar services in Metropolitan Toronto.

The Western and Southern Periphery:

It is expected that spontaneous growth will occur in the western and southern parts of the peripheral zone, as it will along the western segment of Zone 1. In this respect, the role of the Kitchener-Waterloo-Guelph-Galt complex is expected to be substantial,







but development at present is hampered by shortage of water and sewer facilities. Separate studies are proceeding to define further the roles of this and other urban clusters within the context of the Toronto-Centred Region. Similar development limitations also apply now to the Brantford-Paris district. The roles of these centres now must be re-evaluated, with special consideration to the industrial complex now coming into being along the north shore of Lake Erie.

### **The Commutershed (Zone 2)**

Our policy for the commutershed is to retain it to the maximum degree in recreational, agricultural, and other open space uses. It is expected that, by the year 2000, the percentage of population living in this zone will be 4 per cent, somewhat less than the present 4.5 per cent. In actual numbers, we expect 300,000 people in this zone by the year 2000. The high cost of providing sewer and water services throughout this zone is an important consideration in the decisions to reserve it largely for non-urban uses. Such intensive growth therefore should be deflected into the lakeshore area or the peripheral urbanized areas.

The growth which does take place in Zone 2 will be encouraged into (a) the vicinity of an urban axis which is expected to begin in Zone 1 with Richmond Hill and include Aurora, Newmarket, and to a very small degree, Bradford; (b) such communities as Orangeville, Bolton, Acton, Georgetown, Milton, Uxbridge, Port Perry and Stouffville.

Special care must be taken that the northward access does not predominate as an alternative to growth in the eastern segment of Zone 1. Contiguous strip development along this axis must be prevented by proper planning and by retention of non-urban land between the communities.

Finally, it is important to remember that full-scale development beyond the Lake Ontario watershed will require the pumping of treated sewage effluent back into Lake Ontario to minimize the pollution dangers to Lake Simcoe.

### **Maintenance of the Georgian Bay Shoreline, Lake Simcoe, Kawartha Lakes, Niagara Escarpment, and Other Special Recreation Areas**

The recreation sections of the Region demand special attention because of the high population growth, increasing health and leisure time, and improvements in transpor-

tation. The important goal is to minimize environmental damage while at the same time making effective use of the resources. The Development Concept calls for a more comprehensive recreation plan.

Broadly speaking, in terms of urban development constraints, this guideline recommends moderate growth for Peterborough and Lindsay, which are associated with the Kawartha Lakes; Orillia, which is on Lake Couchiching, and Collingwood, which is on Georgian Bay.

### **Transportation Policy**

Development of the Region's transportation system must reflect the Development Concept. The building of the system must stimulate the Concept's pattern of urban centres as well as the land uses. Up to this point the system has been considered mainly in terms of linkages (see Plate 6). The determination of modes, categories, sizes and levels of service will form part of the Comprehensive Development Plan, yet to be completed.

### **Land Transportation**

- a) The land transportation serving the Lakeshore corridor will require extensive additions and should incorporate all the various transportation modes — highway, rail, air, air-cushioned tracked vehicle, hovercraft, etc.
- b) The existing Highway 400, and the proposed Highway 404, together with the proposed GO Transit extensions north, must be carefully defined to ensure an appropriate pattern. These linkages will assist development of Barrie and Midland, which are in linear extension north of Toronto, improve integration of Northern Ontario with the Metropolitan Toronto area, and increase accessibility of people to the recreation areas outside, especially Lake Simcoe.
- c) A generally linear alignment exists from Midland through Barrie, Orangeville to Kitchener-Waterloo-Guelph-Galt, and Brantford. Direct and improved service will be necessary to stimulate and serve the growth of populations along that alignment.
- d) Midland, Orillia, Lindsay, Peterborough and the centre in the Port Hope-Cobourg vicinity are also in a linear alignment and will also be of sufficient magnitude to require improved interconnecting service (though later and of a lesser magnitude than those mentioned above).

- e) These linkages will assist in the integration of Northern Ontario both with the developed parts of the Province to the south-west of Toronto, and with Eastern Ontario. They will not only aid overall provincial integration but permit by-passing of Metropolitan Toronto for direct traffic.

### **Water Transportation**

- a) The Midland port would connect the Region to the market centres of Chicago and Detroit and may prove to be a valuable asset in the future if Great Lakes shipping experiences a resurgence. It may also act as a collection point for commodities shipped by water.
- b) A port attached to the centre proposed for the vicinity of Port Hope-Cobourg would provide another facility for shipment to ports down the St. Lawrence River and beyond.

### **Air Transportation**

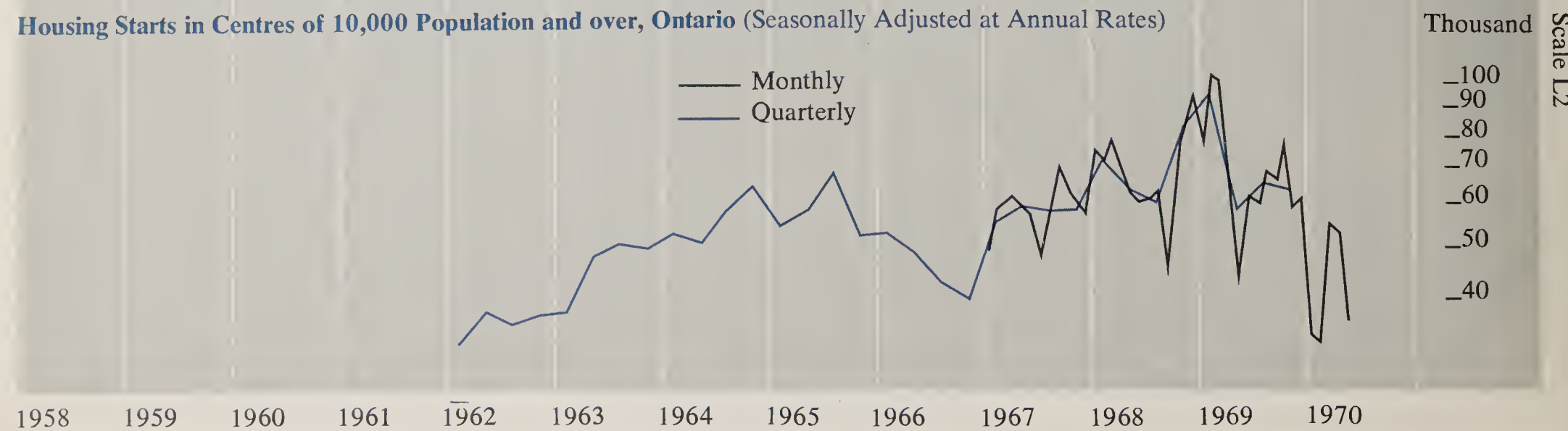
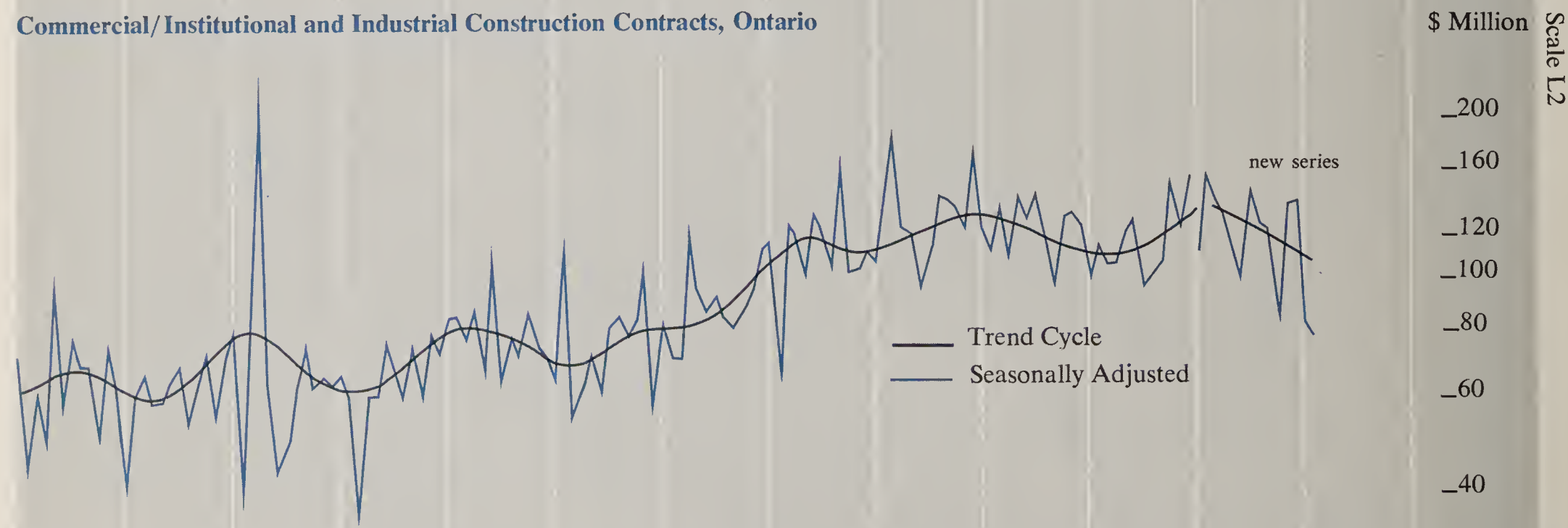
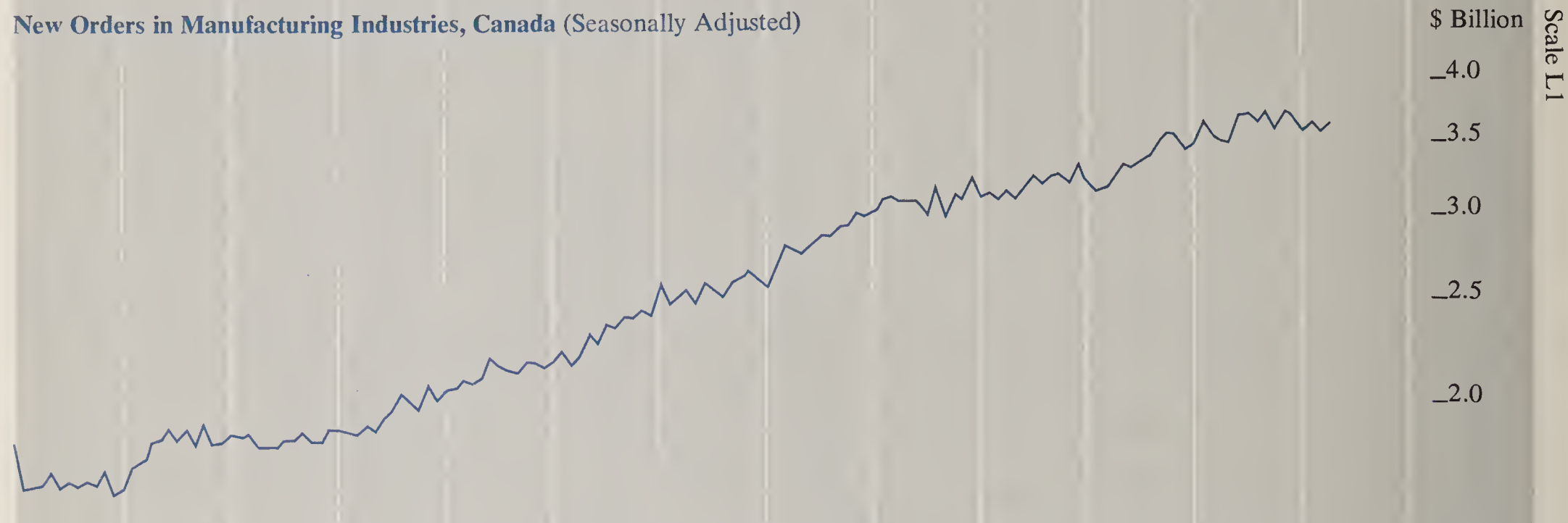
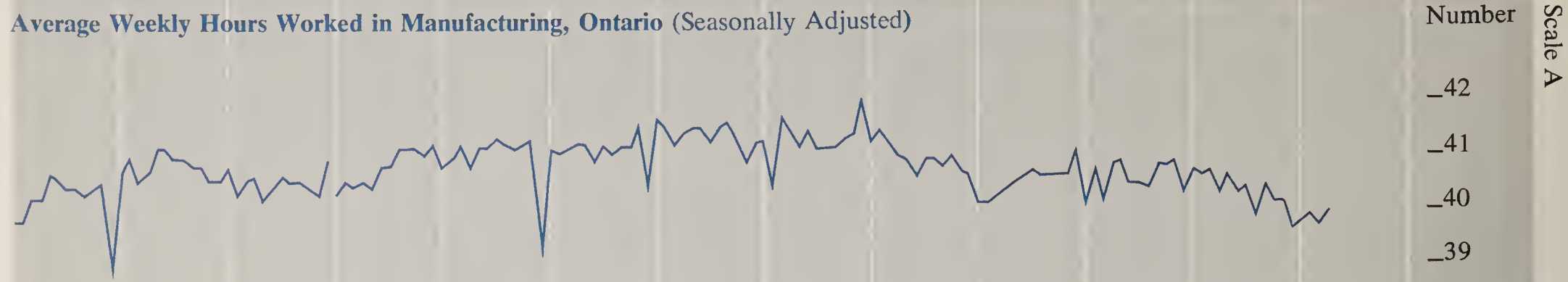
- a) Malton will continue to exert an enormous influence on the shape of the Region.
- b) The location of a new international airport to serve South-western Ontario would be of most crucial significance to the future spatial pattern of the Toronto-Centred Region. An airport will bring it into an immediate impact area, in excess of 120,000 people with public and private investment in excess of \$3 billion. Furthermore, since a new airport will require highly efficient transportation routes between itself and Malton, a new corridor for potential development will be created. The integrity of the Development Concept requires that a site be chosen which does not add such a powerful magnet for development in a location which conflicts with the strategic components of the plan.

### **Summary**

The Design for Development for the Toronto-Centred Region, as for the other regions in Ontario, is based on three fundamental objectives: (1) the encouragement of a more even distribution of people in Ontario, (2) the improvement of the quality of life for these people, and (3) better use of the natural environment. These are the cornerstones of the provincial regional development program. This Report is the first in a series which as a group will provide a concept for the development of all Ontario.



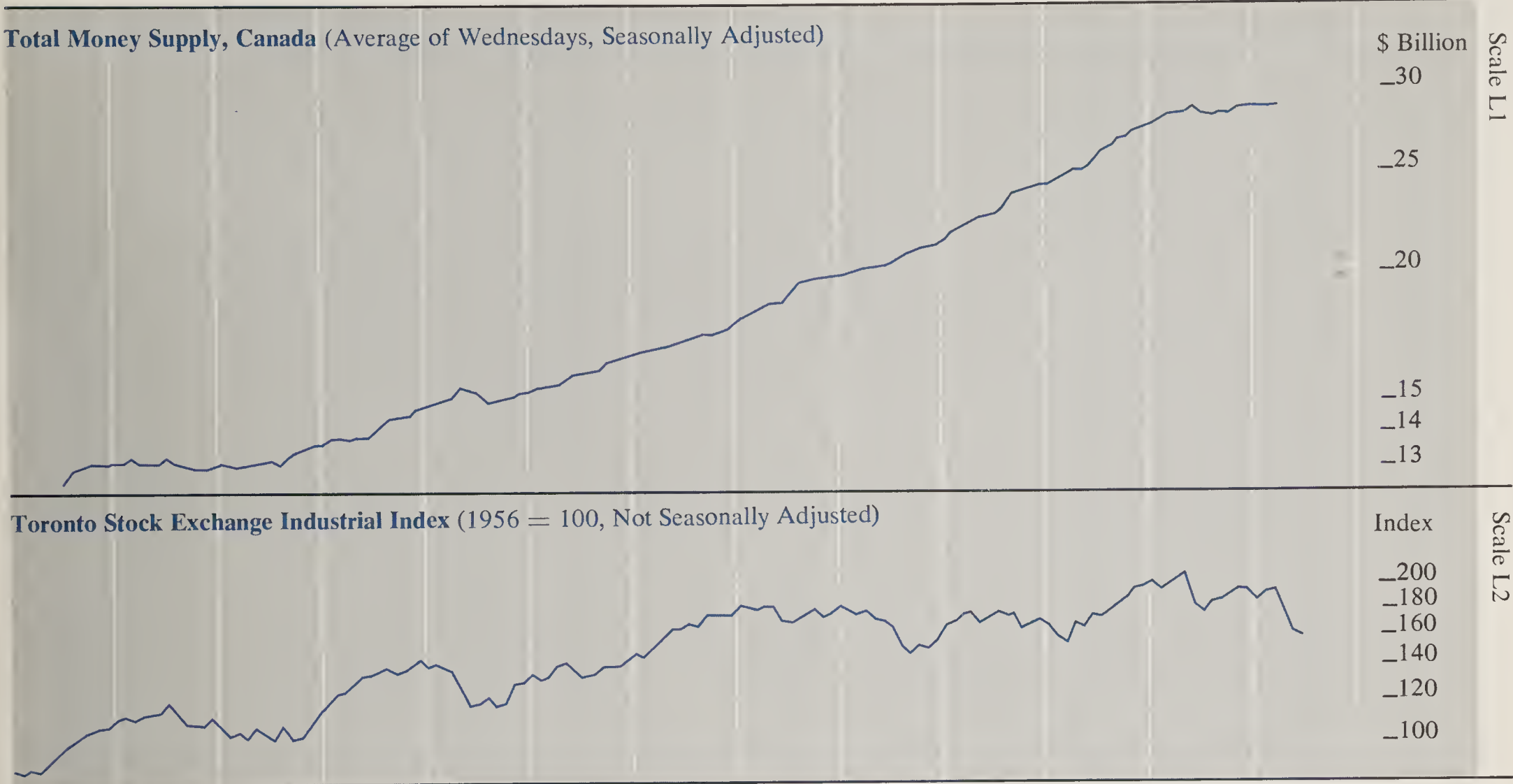
# Leading Indicators



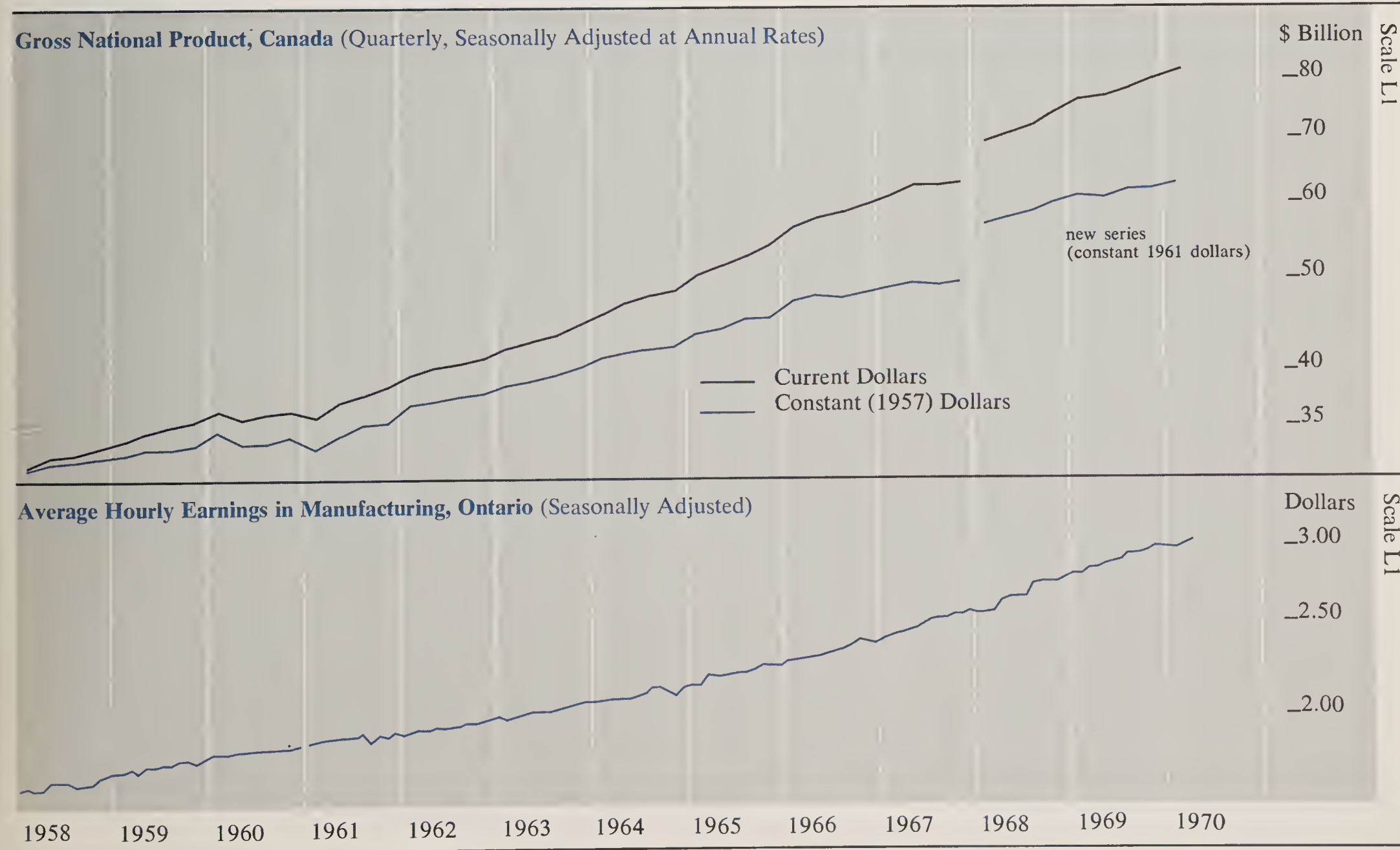
1958    1959    1960    1961    1962    1963    1964    1965    1966    1967    1968    1969    1970



# Leading Indicators



# Coincidental and Lagging Indicators



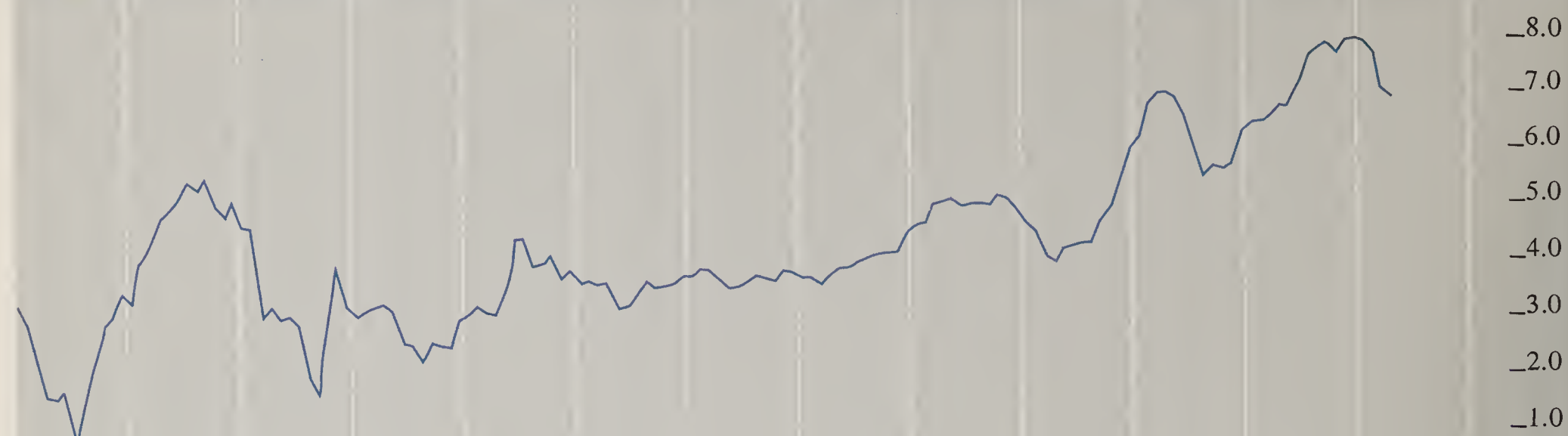


# Coincidental and Lagging Indicators

**Average Yield of 3-Month Treasury Bills, Canada** (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent

Scale A



**Employment, Ontario** (Seasonally Adjusted)

Million

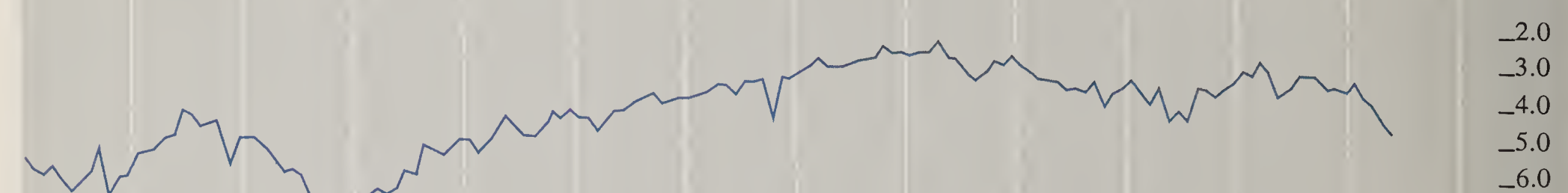
Scale L1



**Unemployment Rate, Ontario** (Inverted Scale, Seasonally Adjusted)

% of Labour Force

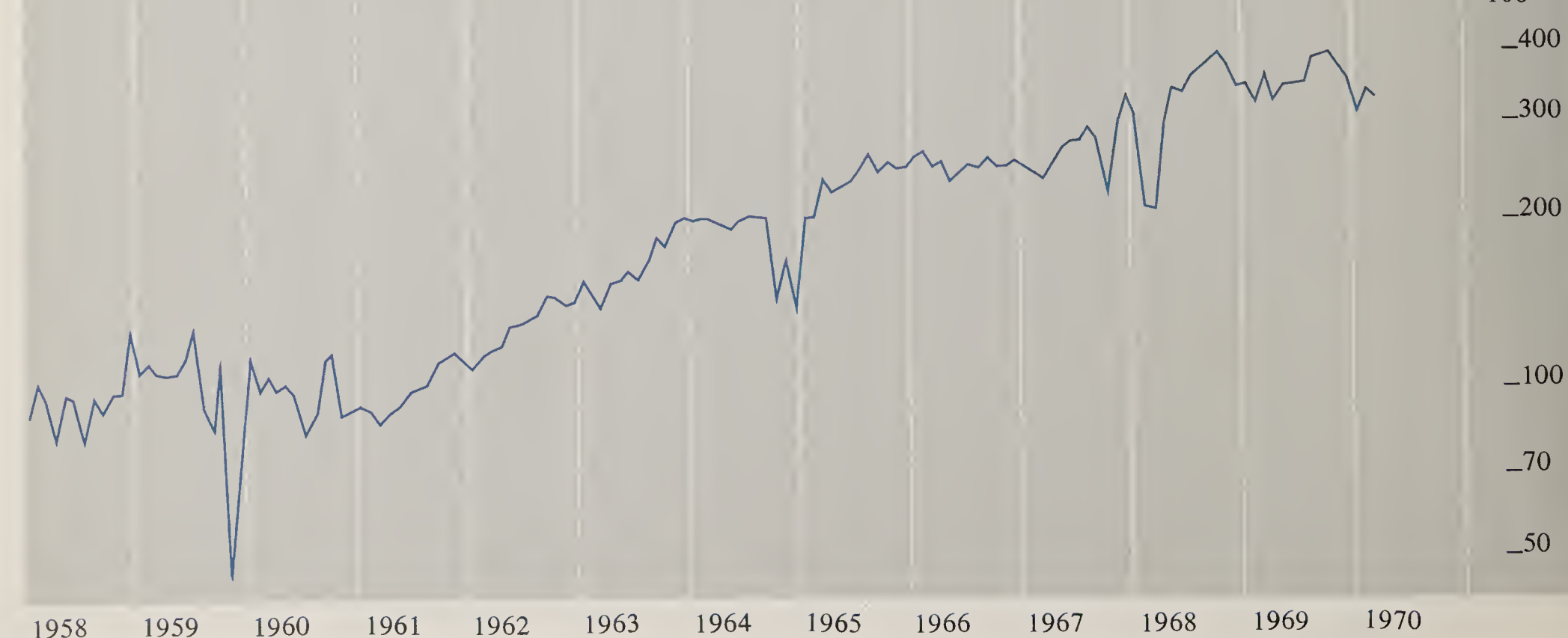
Scale A



**Index of Motor Vehicle Production, Canada** (1961 = 100, Seasonally Adjusted)

Index  
1961 =  
100

Scale L2



1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970



# Economic Indicators

17

Seasonally Adjusted

		1969									1970				
		April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
<b>Leading Indicators</b>															
Average Weekly Hours Worked in Manufacturing	Number	40.1	40.4	40.1	40.2	39.6	40.3	39.9	39.9	38.4	39.6	39.7	39.5	40.0	40.3
New Orders in Manufacturing Industries <sup>c</sup>	\$ Million	3,539	3,564	3,743	3,741	3,690	3,770	3,634	3,754	3,728	3,662	3,696	3,604	3,662	
Commercial/Institutional and Industrial Construction Contracts	\$ Million	126.1	112.8	93.9	144.0	127.0	123.2	86.6	137.3	140.0	72.1	78.4			
Urban Housing Starts (Annual Rate)	Number	79,900	45,300	63,900	60,800	69,300	67,300	78,300	59,100	64,700	34,800	33,600	55,700	53,900	37,000
Money Supply <sup>c</sup>	\$ Million	28,331	28,336	28,638	28,324	28,292	28,403	28,472	28,580	28,917	28,955	28,947	28,817	28,966	
T.S.E. Industrial Index <sup>u</sup>	1956 = 100	195.31	197.23	177.34	168.65	175.43	178.15	182.11	187.65	186.37	177.89	183.92	185.17	171.08	154.21
Business Failures <sup>u</sup>	Number	58	48	35	32	51	52	64	54	53	56	71	82	54	65
Business Failures — Liabilities <sup>u</sup>	\$ Million	3.2	1.9	2.0	0.9	2.6	4.8	3.4	4.6	2.2	9.9	18.7	4.0	2.2	3.4
<b>Coincidental and Lagging Indicators</b>															
Gross National Product <sup>c</sup> (Annual Rate)	\$ Million			77,480			79,292			80,888			82,876		
Average Hourly Earnings in Manufacturing	Dollars	2.89	2.92	2.93	2.94	2.97	2.97	2.99	3.02	3.06	3.06	3.05	3.11	3.16	3.19
3-Month Treasury Bill Rate <sup>u</sup>	Per Cent	6.80	6.74	7.13	7.62	7.69	7.77	7.60	7.76	7.81	7.78	7.60	7.00	6.78	
Cheques Cashied in Clearing Centres <sup>1</sup>	\$ Million	6,243	6,066	6,152	6,458	6,560	6,570	6,526	6,521	6,240	6,078	6,099	6,661	6,487	
Retail Trade	\$ Million	866	866	875	884	886	901	892	895	909	891	869	884	906	904
Labour Force	000's	3,038	3,071	3,035	3,028	3,004	3,027	3,035	3,030	3,064	3,044	3,066	3,098	3,111	3,183
Employed	000's	2,948	2,958	2,926	2,935	2,910	2,932	2,930	2,927	2,957	2,948	2,957	2,981	2,977	3,037
Unemployed	000's	90	113	109	93	94	95	105	103	107	96	109	117	134	146
Unemployed as % of Labour Force	Per Cent	3.0	3.7	3.6	3.1	3.1	3.1	3.4	3.4	3.5	3.2	3.6	3.8	4.3	4.6
Wages and Salaries	\$ Million	1,271	1,288	1,295	1,318	1,303	1,312	1,318	1,336	1,347					
Index of Industrial Employment	1961 = 100	131.4	131.4	131.0	129.6	129.3	129.6	130.7	132.7	132.8	132.1	133.0	132.7	132.1	131.4
Index of Industrial Production <sup>c</sup>	1961 = 100	167.7	167.0	167.1	166.8	164.5	165.9	165.6	169.3	172.0	171.1	174.4	171.5	172.5	171.1
Total Manufacturing <sup>c</sup>		167.3	168.5	169.0	169.3	166.5	166.8	166.7	169.5	170.7	167.8	171.0	168.1	170.1	168.1
Non-Durables <sup>c</sup>		150.2	150.6	151.1	151.6	152.5	153.0	152.4	153.4	154.3	152.3	154.3	152.8	154.7	155.6
Durables <sup>c</sup>		188.2	190.3	190.8	191.0	183.7	183.8	184.1	189.2	190.7	186.8	191.4	186.7	189.0	183.4
Mining <sup>c</sup>		155.7	145.5	142.6	138.9	136.2	141.8	140.3	151.8	163.4	170.2	175.7	170.6	164.0	167.4
Electric Power and Gas Utilities <sup>c</sup>		186.2	186.1	187.1	189.0	190.1	194.6	195.5	194.6	197.0	201.0	203.0	203.0	206.4	203.4
Primary Energy Demand (Annual Rate)	BKWH	59.20	58.54	59.12	60.28	58.83	58.39	59.09	59.56	63.13	64.53	63.91	62.94	63.39	61.60
Exports (including re-exports) <sup>c</sup>	\$ Million	1,194.2	1,233.6	1,212.5	1,196.0	1,161.7	1,293.4	1,283.0	1,285.0	1,328.9	1,447.0	1,402.1	1,410.0	1,438.7	1,435.0
Imports <sup>c</sup>	\$ Million	1,149.3	1,166.6	1,215.2	1,124.2	1,136.3	1,220.1	1,206.7	1,223.2	1,215.0	1,116.8	1,230.6	1,242.0	1,185.3	1,211.0
<b>Unclassified Indicators</b>															
Foreign Exchange Reserves <sup>u</sup>	U.S. \$ Million	2,782	2,760	2,623	2,565	2,594	2,539	2,629	2,613	2,616	2,698	2,777	2,936	3,179	
Industrial Materials Price Index <sup>u</sup>	1935-39 = 100	267.7	271.8	270.6	270.5	269.2	270.4	266.8	267.8	271.5	272.3	272.3	275.7	274.4	275.4
Consumer Price Index <sup>u</sup>	1961 = 100	124.6	124.9	125.9	126.4	126.9	126.6	126.8	127.4	127.9	128.2	128.7	128.9	129.7	129.6

<sup>c</sup>Statistics for Canada.

<sup>u</sup>Not seasonally adjusted.

<sup>1</sup>Ontario less Toronto.

HA/747/.0656

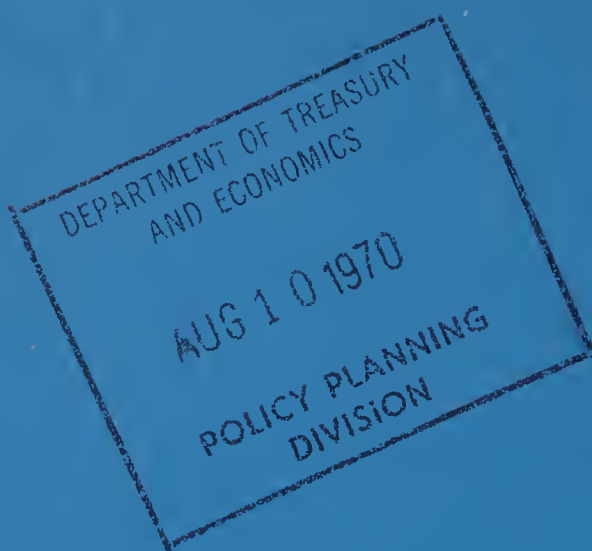
Ontario, Dept. of Economics and  
Ontario economic review

Jul/Aug  
gmwg

c.1

1970  
BAS





DEPARTMENT OF TREASURY  
AND ECONOMICS

AUG 10 1970

POLICY PLANNING  
DIVISION





# Ontario Economic Review

---

Sept/Oct 1970  
Volume 8, Number 5

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister

---

HA  
747  
.0656

1970  
Sep/Oct  
c.1 BAS



# Ontario Economic Review

September/October 1970

Volume 8, Number 5

## The Possible Uses and Limitations of Planning

L. Bodnar, *Economist*

Department of Treasury and Economics

## Geocoding—A Technique in the Development of Urban Information Systems

E. Weatherhead, *Statistician*

Department of Treasury and Economics

## Selected Economic Indicators

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. Charles S. MacNaughton  
*Treasurer of Ontario and  
Minister of Economics*

H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

### About The Review

The feature article for the September/October edition of the *Ontario Economic Review* examines Geocoding — a geographically referenced data storage and retrieval system which emphasizes provision of data on larger urban centres by specified areas.

The rapid growth and constant change of urban areas in recent decades has led to a recognition that future growth will have to be better regulated if we are to maintain our cities as desirable living entities. At present there is a great need for small-area data which are timely and accurate and which reflect the changing levels of urban activity. Geocoding is intended to provide a larger quantity of better quality data which can be more quickly obtained, easily understood and correctly used.

Mr. Weatherhead is a statistician with the Ontario Statistical Centre, Economic and Statistical Services Division, Department of Treasury and Economics. The author wishes to acknowledge Mr. Robert Ion and Mr. Harold Goldstein, as much of the material in this paper is based on their articles; respectively, "The Geographic Basis of the DBS Geocoding System for Urban Areas: An Overview", December 1969, and "The Urban Information System: Some Concepts, Issues and Experiences", May 1969.

In a short article on the uses and limitations of planning, Mr. L. Bodnar of the Economic Planning Branch, Department of Treasury and Economics outlines some aspects of the role and inter-relationship of the professional planner, the politician and the general public in the field of planning. Emphasis is also placed on the proposition that planning is a technical tool to be used in the rational allocation of resources and should not be considered as a threat to personal freedom.

### Indicator Charts, Pages 13-15

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 13-15 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



# The Possible Uses and Limitations of Planning

1

L. Bodnar, *Economist*

Department of Treasury and Economics

## Introduction

Governments as well as private firms are becoming increasingly aware of the need to examine systematically the implications of their policies and to devise plans or strategies to reach their objectives promptly and efficiently. Plans serve the *future* but involve *present* decisions, as well as future ones. Governments, for example, must make decisions to allocate resources among such areas as highways, medical and health services, educational facilities, housing and recreation and numerous other matters. It is essential, therefore, that rational, scientific methods be applied in assessing future requirements, in allocating resources and in reviewing the validity of the assumptions and methods applied in the process of policy-making. In Myrdal's formulation:

“coordination leads to planning, or rather, it is planning as this term has come to be understood in the Western world. Coordination of measures of intervention implies a reconsideration of them all from the point of view of how they combine to serve the development goals of the entire national community, as these goals become determined by the political process that provides the basis of power.”<sup>1</sup>

The growing importance of planning is indicative of the tendency for public policy matters to become increasingly concerned with strategies aimed at maximizing overall welfare while not reducing any individual's well-being. This concern with the future, combined with revolutionary changes in technology which have made possible the attainment of a wide range of welfare goals, has led to a great increase in the importance of planning.

Planning is frequently defined as a process by which one attempts to influence the course of future events in order to achieve selected goals. It is necessary, however, to add that goals are dynamic rather than static. Therefore, the planning process must be flexible enough to enable the planner to modify both the chosen goals and the means of achieving them.

This article will deal with some selected aspects of planning rather than the subject as a whole. The two main topics to be considered are:

1. the role and the inter-relationship of the professional planner, the politician and the general public in the field of planning;

2. the proposition that planning is nothing more than a technical tool to be used in the rational allocation of resources rather than a threat to personal freedom.

## The Language of Science

As a result of an increasing awareness of the value of the scientific method, it can be expected that modern society will attempt to follow a scientific approach in the search for solutions to the everyday problems that confront it. Planning — as applied today in North America — is based on a combination of empirical knowledge, stated objectives and the application of logical methods to achieve these objectives. Thus planning, by definition, is a scientific method, the application of which enables us to attain our objectives in the most efficient manner.

However, in the use of the scientific method we are faced with a serious problem which has, in some cases, discredited the entire approach. This problem is the use of a jargon by the technician who finds special words or word meanings very helpful in his work. For the layman, this jargon is mystifying. Accordingly, unless the planner translates his findings and proposals into ordinary language he runs the risk of being misunderstood and having his ideas rejected.

## Model Building

The indiscriminate application of mathematical models to evaluate programs represents another serious problem. In many instances, models are expected to provide the complete cure for all socio-economic ills, rather than function as an analytical tool to be used by the professional.

A look at the following steps used in the development of a planning model may help to demonstrate its capacities and limitations:

1. The specification of a theoretical model;
2. Testing the validity of the theoretical model;
3. Examination of the divergence between the model and reality.

In a model one simplifies reality in order to help develop an understanding of a complicated real-life situation. It is also important that we realize a model is only useful to the extent that it is relevant and effectively represents things as they really are. The empirical inputs of a model are thus of overriding importance. However, it is unnecessary and frequently undesirable for a model to completely reflect every aspect of the situa-

tion it is designed to represent. All that is required is that the model portray accurately the effect of policy changes on the selected interrelated variables.

This combination of the abstract model and direct human judgment based on empirical observation will only provide an approximation of the actual events. Thus, the output of the model should be used only as a yardstick. The validity of the model should be tested continuously, the test consisting of a comparison between the results obtained from the use of the model and observations from real life. If the divergence is too great, the model should be modified appropriately.

Naturally, in a dynamic situation the points of reference and their relationships are continually changing, and thus there is a constant need for checking the relevance of the theoretical planning model against the points of reference in the *real* world.

Unfortunately, the general public has become sceptical and even apprehensive about the use of models; once again, because of the misuse of some models, such suspicions are often justified.

## Technocrats — Politicians — Public

In elaborating development plans, one of the major theoretical problems encountered is the definition of some objective measure of priorities.

When we try to answer the questions, “What is the good life?”, “What is the objective hierarchy of values?”, or simply, what is the ‘real’ meaning of the phrase, “first things first”, we are faced with profound semantic and philosophical problems.

As these all-encompassing criteria are not yet available, countless and endless discussions deal with; “the quantification of social welfare functions”, “the objective trade-off between pollution and better justice” or “the nature of the public good”. In the midst of these discussions the public is becoming increasingly disoriented and sceptical.

Once again the professionals have only themselves to blame. When, in a democratic society, one is working in an area as sensitive as planning, scrupulous attention must be paid to the effect on the public of each pronouncement on the topic. Even though it is difficult to develop programs that satisfy all members of the community, public discussion on the subject is essential both for the information of the planner and the education of the community; it is at this point that the

<sup>1</sup>Gunnar Myrdal, *Beyond the Welfare State* (New Haven: Yale University Press, 1960).



role of the politician is vital. In the ideal sequence of events, the planner obtains as much information as is available on a series of alternative programs. He then presents this information in a coherent and intelligible form to the politician, and the politician, as the representative of the public, decides among the alternatives. In this way, to the extent that the politician is in close touch with his constituents, an acceptable system of priorities is established.

### Minimum Levels of Performance

Although a complete specification of the needs of a community is impossible, many practical difficulties concerning planning can be significantly reduced by identifying minimum or mandatory levels of performance of social services as opposed to higher levels of performance that may, if they are of interest to the community, be negotiated at a later date.

The minimum level of performance for a social service at any particular time is established by taking into account maintenance of the present level of performance of that public service, expanding only in response to growth of the population.

To these minimum levels of service, cost-effectiveness criteria should be applied to secure the optimum allocation of available resources. Higher population and higher industrial output tend to increase the public expenditures required to maintain the minimum level of services. It is interesting to note at this point that, according to the economic and political philosopher Bertrand de Jouvenel, "a most moderate program in this respect (the field of social investment) implies that public spending for this objective should be multiplied eight times in 25 years, while the sum of personal incomes would be multiplied by three times and income per head two-and-a-half times."<sup>2</sup>

Estimation of the expenditure required for a minimum level of performance of public services involves the application of technoeconomic coefficients which indicate the resources necessary to provide the expected level of social service. There may, of course, be a number of alternative solutions in both technical and financial terms to achieve the same level of performance for a particular social service. It is necessary that decision-makers select the most appropriate alternative. For this purpose, they must have all of the available information.

### Negotiated Levels of Performance

As a result of cultural change, increased urbanization, technical progress, etc., a society may become dissatisfied with the existing levels of performance of services. This requires the development of "higher" or negotiated levels of performance of public services as objectives for the community.

The question then arises as to how to objectively measure the satisfaction brought by these enhanced levels of performance. Can or should a uniform criterion be established in this respect? It is doubtful. The allocation of public funds will depend in general on the pressures exerted by the proponents of the different sets of objectives. That is to say, the extent to which the public (represented and persuaded by politicians) is willing to accept further burdens which may mean the curtailment of personal choices in favour of enhancing the scale and variety of public alternatives.

Attempts can be (and are) made to quantify in financial terms the benefits obtained from these additional social services. Attempts have also been made to find an objective measure of the trade-off values between the alternative uses of public funds. However, the very nature of these negotiated performance levels may defy quantification of this kind. They correspond to value judgments and involve group interests. All these factors are a part of the human condition and reflect the scale and variety of choices, but through the mediation of the politicians, the public's wishes can be made known.

### Planning as a Tool

Planning, by itself, does not set objectives, does not limit choice nor restrict personal freedom. Planning is a rational method of coordinating the allocation of resources for future developments. It may, in fact, have as its immediate objective the opening up of new options, thereby enhancing the multiplicity of choice. Comprehensive land-use plans, for example, can save valuable farm lands for agriculture while providing adequate residential areas and outdoor recreational facilities. Just imagine how planning could have improved the water of our lakes and rivers, the air we breathe, our cities!

Plans may be designed to meet negotiated requirements or — as another extreme — could deal exclusively with minimum requirements for public services. In Western societies, the planning process usually contains

both minimum and negotiated components. The boundaries between these two levels of performance are themselves subject to change over time. Once a negotiated level of performance has been accepted and incorporated into the public expenditures, it then tends to be considered as non-negotiable, and in fact, becomes the new minimum. However, these previously negotiated levels of performance continue to represent a secondary layer above the hard-core, basic requirements for social services and could in extreme circumstances be totally or partially removed as a result of political change.

Planning does not in any way set policy; its only function is to provide a strategy whereby a community may attain certain objectives. To the extent that the planning is employed successfully, a community uses fewer resources and spends less time achieving its objectives than it would without a plan. The particular relevance of planning to the present day situation is that the problems of the world are becoming progressively more severe. High living standards and rapid population growth combined with increasing technological change all require the husbanding of resources on an unprecedented scale. We can no longer afford to live as though our environment were limitless. It is now necessary to plan so that we use our resources in the best way possible.

Unfortunately, in the past this was not done, and we are now suffering the consequences. We are now burdened with the task of suppressing the effects of retained pesticides, disposing of nuclear wastes and eliminating water and atmospheric pollution in plant and animal tissues. In addition, because of a lack of foresight in the past, we must now put up with regulatory measures resulting from the conflicting demands on our resources.

This situation will likely persist if we continue to regard economic growth as a good thing in itself. We are now having to pay for our growing abundance of material goods with increasing environmental discomfort and anxiety. As a result, the number of people insisting on the need to change our life-style and value system is increasing. Thus it is vital that attempts to improve the quality of life be based on comprehensive, technically efficient planning activities.

### Summary and Conclusions

The submission of any proposed plan to the cabinet, parliament and the public has to be

<sup>2</sup>*The Technocratic Age*, Bulletin of the Atomic Scientists. V.20, 1964.



more than a ritual. It is a vitally important step which serves to check the validity of the assumptions and the feasibility of attaining the stated and implicit objectives of the proposed plan.

Public discussions of a plan are particularly important when alternative proposals to meet requirements for public services could significantly influence the lives of a great number of people. It is exactly these controversies that can give the people a chance to influence decisions regarding their own future.

The democratic decision-making process implies the active participation by well-informed citizens. However, the growth of technology has decreased the individual's share of the knowable, resulting in an increasing gap between the knowledge of the expert and the understanding of the public. This is

one of the reasons why the public is becoming increasingly disoriented and indifferent in issues which are vitally important.

Specific points that must be kept in mind are the following:

1. In order to provide the public with an opportunity to understand special technological problems, specialists should use the simplest possible language in explaining their proposals.
2. In our society, planning, concerned with strategies aimed at satisfying a number of (minimum and negotiated) requirements, is becoming increasingly important. However, we have to realize that planning models are logical tools only. Their usefulness depends on their validity and the validity of the models must be tested against reality on a continuing

basis. Consequently, technocrats, politicians and the public must work together in planning.

3. The fulfilment of basic, minimum requirements assures the survival of man as a social being, but a multiplicity of choices assures the survival of man as an individual.
4. Once the community has set its own objectives, it is the planners' task to ensure that these objectives are attained promptly and economically.
5. To make this whole process workable, all citizens should be informed as to the effects that change has on a society. Only in this way can all citizens make meaningful contributions to a democratic planning process.



# Geocoding—A Technique in the Development of Urban Information Systems

E. Weatherhead, *Statistician*  
Department of Treasury and Economics

## The Information Problem

The rapid growth and almost unbelievable change that urban areas have experienced in recent decades has led, slowly but surely, to recognition that future growth will have to be better regulated if we are to maintain our cities as desirable living entities.

Realistically, this cannot be adequately done unless we are in a position to readily identify problem areas, pressing needs and issues relevant to proper development. Knowledge of existing conditions, in terms of people, property, and metropolitan structure is essential. Our present knowledge is not adequate.

The problems of providing information necessary for effective decision-making within cities are unique. Cities rely, to a large degree, upon data generated at provincial and federal levels which are not, generally, adequate for their needs. Cities have a great need for small-area data which are timely and accurate and which reflect their always-changing level of activity. This need is not met today.

The decennial census of population and housing provides extensive information about the urban environment, but in rapidly changing areas this information quickly becomes obsolete. Studies aimed at pressing problems have gathered data on a 'one shot' basis, but generally fail to provide the means for regular supplementation of this data.

It is an unfortunate fact that many vital public decisions are made without access to current and comprehensive data on the urban environment. Often, the relevant problems cannot be properly defined or even recognized due to the inadequacies of the data and the constraints imposed by agency considerations, an approach which limits the comprehensive perspective.

## Growing Technology

Recent advances in electronic data processing have made it possible to consider the development of systems to cope with the above problems. The advent of the large-scale computer has, in some cases, multiplied by factors of a thousand the capability for developing and maintaining large data files. Program options, which previously have not been feasible, are now a reality and the development of both hardware and software has now reached the point where large-scale computers can be realistically utilized to put the information problem in order.

## Unco-ordinated Approach

Unfortunately, governmental collection and development of information has reached its present status in an 'ad hoc' fashion. Much data is gathered by public agencies in the course of their normal activities. Each agency, however, is interested only in the specific data it needs for its own particular operational responsibilities. There is little attempt at interagency communication, to discover if the data needed already exists, or to ascertain whether another agency needs data which can be easily collected, at minimal extra cost, during the course of a proposed survey. A comprehensive view is nonexistent.

The resultant chaotic situation is unfortunate. Data are collected and coded without proper regard to methods and procedures developed elsewhere. Consequently, it is not difficult to understand the sources for the incompatibility of existing material.

## The Nature of the Need for a Planning Information System

The nature of the need for data on a small area basis was emphasized by the 1966 census which showed that nearly one-half of Canada's population at that time — some 9.7 million people — were living in 19 metropolitan areas. Moreover, the Economic Council of Canada has estimated that well over 80 per cent of the 25 million population it forecasts for Canada in 1980 will live in urban areas — and that about 40 per cent of these urban dwellers will live in the Montreal, Toronto, Vancouver, Winnipeg, Calgary, Edmonton and Ottawa regions alone.

The rapid advancement in data processing technology and statistical methodology together with the expansion of statistical needs by economists and other data users has rendered former methods of collecting, organizing and disseminating data inefficient and obsolete. Complete utilization of data currently being gathered at great cost and inconvenience is being thwarted by the application of inflexible and incompatible geographic and other standards, which prevent the convenient manipulation and integration of data. Consequently, there is an urgent need for new methods of assembling and providing data for policy planning and analysis. Geocoding is intended to provide improvements in efficiency by allowing the integration of various kinds of data for any specified area. This procedure should provide a larger quantity of better quality data which can be

more quickly obtained, easily understood, and correctly used.

## The System — Geocoding

In response to the need, the Dominion Bureau of Statistics has under development a computerized system for providing 1971 census data for large urban areas on a user-specified basis.

It is envisaged that the system will eventually make available any combination of census or other data for virtually any area that the user might specify (within minimal limitations). The main objective is to provide tabulations relatively quickly and inexpensively by automatic selection and aggregation of a series of building blocks that make up the area specified by the user. In the larger urban areas these would be city block-faces; enumeration areas will be used elsewhere. The service will be made possible by the automatic precoding of all census addresses.

Eventually, diverse socio-economic statistics from other surveys could become available on a similar basis, with cross-tabulations in a variety of combinations.

This Geographically Referenced Data Storage and Retrieval System (GRDSR), more commonly called Geocoding, emphasizes provision of data on larger urban centres by areas specified by the user, as opposed to present standards, such as, enumeration areas, census tracts, and municipalities (for which census data will continue to be provided).

The system consists of a set of data processing operations and the storage and retrieval of the corresponding data on randomly accessible data storage devices. It provides flexibility for the retrieval and tabulation of any combination of census data and for cross-referencing of different data files by any specified area (provided that the confidentiality requirements of the Statistics Act are safeguarded).<sup>1</sup>

## Conceptual Aspects

Geocoding is a refined technique of geographically coding addresses by assigning to each of them, through a computer process, x, y co-ordinate values. The system is based on the fact that most surveys or pieces of information have common reference points — the addresses of respondents.

On this basis, once a survey is taken, the data obtained from each respondent is attached to his address, which can be converted to a machine readable form. Then the

<sup>1</sup>Dominion Bureau of Statistics, *Geocoding — Facts by Small Areas, Ottawa, 1968*



appropriate geographical co-ordinates, as referenced in the *Universal Transverse Mercator System*, are attached to the address.

#### Address Conversion File – Concept

A necessary tool for the referencing of information to areal units is the Address Conversion File (ACF). The ACF is a listing from the area of all block-faces (generally one side of a street separated by consecutive intersections) by:

- (a) block-face terminal addresses;
- (b) street names;
- (c) block-face centroid co-ordinates.

As an essential working machine readable file, the ACF must be kept constantly up to date as to changes of addresses, changes in street names, and all other pertinent data.

A graphic and tabular representation of the ACF is given in Table 1 and Figure 1.

The work required for establishing an Address Conversion File represents a major effort at the present time. It is estimated that the preparation of a conversion file for a city

of one million people currently would take three clerical man-years work. It is very likely, however, that this time will be halved by improved system design, methodology and on-the-job experience. The creation of the conversion file requires:

1. The selection of an accurate map of the municipality;
2. The updating of it;
3. Preparation and keypunching of a street index;
4. The digitization of strategic points along all streets representing beginnings, ends, intersections, and changes in direction;
5. The preparation, coding and keypunching of address ranges by block-face;
6. The input data must be edited, verified, and processed by computer;
7. Block-face centre points are calculated and the address conversion file is produced.<sup>2</sup>

A by-product of the operation is a plotted street map for the municipality. Figure 2, page seven is an example of a computer printed map.

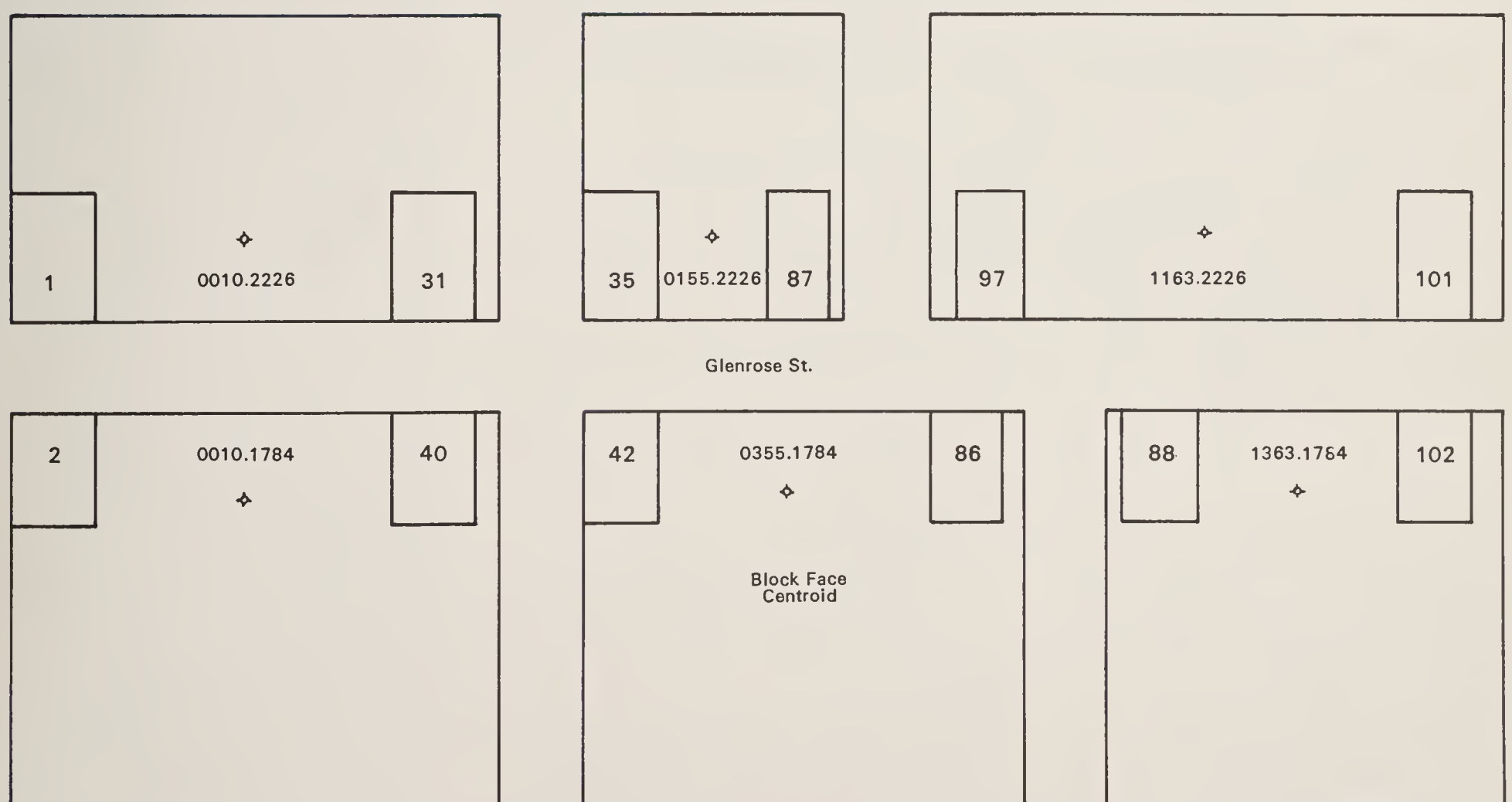
**Table 1 – Tabular Representation of Address Conversion File**

Street Name	Block Face Address Ranges		Block Face Centroid X.Y
Glenrose St.	1	31	0010.2226
Glenrose St.	35	87	0155.2226
Glenrose St.	97	101	1163.2226
Glenrose St.	2	40	0010.1784
Glenrose St.	42	86	0355.1784
Glenrose St.	88	102	1363.1784

#### Defining the Query Area

Using the block-faces as units, the urban user can define his own specific study area simply by outlining the block-face within the desired area. This may be done, and preferably should be done, on a computer-printed map which DBS proposes to supply.

**Figure 1 – Address Conversion File – A Graphic Illustration**



<sup>2</sup>J. I. Weldon and I. P. Fellegi, Computer Methods for Geographical Coding and Retrieval of Data in the Dominion Bureau of Statistics, DBS, Ottawa.



Areas may be enclosed by streets, or by other well-defined boundaries, may cut across boundary lines of census tracts or enumeration areas (in urban applications) but may not cut across block-faces. Thus, the user has considerable flexibility in areal delineation and almost unlimited practical possibilities are opened up for users whose interests are essentially small area in nature. Typical of areas that could be studied under the GRDSR system are school districts, town planning districts, traffic zones, product testing, and marketing zones.

It should be emphasized again at this point that the confidentiality requirements of the Statistics Act prohibit disclosure of information on individuals or individual bodies. Therefore the user should not expect to receive data for individual block-faces or even city blocks. However, the benefits of the system far outweigh this constraint.<sup>3</sup>

### Storage and Retrieval

Once geocoded, data for individual records are stored as strings — each string recording the information for one data characteristic of the population reported.

Information in each string will be arranged as to:

- (a) Individuals within households;
- (b) Households within block-faces;
- (c) Block-faces within the urban geocoded area.

There are as many data strings as there are data characteristics recorded. While the design of the strings assures maximum efficiency in retrieval and cross-tabulation, the required data strings and the portions corresponding to the designated retrieval area are accessed through the block-face centroids.

By storing data in this fashion, it is anticipated that retrieval will be a relatively simple operation.

In the initial step, the user will specify the exact data characteristics, the precise variables for these characteristics (age, sex, income, ethnic origin, etc.) and the boundaries of the requested area. Computer processing will then select all the block-face centroids which lie within the area. From this point, a generalized program will retrieve and tabulate requested data fields bearing the selected block-face identifications. No programming work will be required on the part of the user, nor any knowledge of computer programming.

### Scope and Limitations

Geocoding urban areas requires a large initial supply of street input information, such as, accurate street maps and up-to-date address ranges — and this information must be constantly updated.

Since this information must be coded for computer processing, there are obvious limits on the number of urban areas that can be geocoded by DBS for the 1971 census. Present objectives call for processing those areas that had a city-proper population in 1966 of at least 100,000 — providing also that there are local agencies in these areas that are prepared to supply and periodically update the required street input information.<sup>4</sup>

### Activities in Ontario

Recognizing the importance of geocoding for urban analysis and policy planning, a team from the Ontario Government, comprised of members of the Department of Treasury and Economics and the Department of Highways has been formed to investigate the possibility of applying geocoding techniques to projects in Ontario. To further assess the need for and usefulness of geocoding within the Ontario Government, a seminar on geocoding sponsored by the Ontario Statistical Centre was held in September 1970. The seminar was a part of the research work and general activities conducted by the Ontario Statistical Centre in the area of geocoding.

### GEOCODING — A TECHNICAL VIEW

The prime concept of the Dominion Bureau of Statistics Geocoding System can be examined with a view to underlining the importance of the system's spatial framework in the attainment of its objective; namely, tabulation of data by 'ad hoc' areas specified by the users.

The three main elements of the spatial framework are:

1. The block-face;
2. the address range of each block-face;
3. the geographic co-ordinates of each block-face.

### The Basic Concept

In order to furnish users with data for small areas specified by them on an 'ad hoc' basis, a spatial framework is required, composed of primary areal units to which data can be referenced or coded (hence 'geocoding'), and from which, in aggregation, the query areas

of data users can be constructed. Although the specific properties of the primary areal units will vary according to the spatial framework and system adopted, there are at least three significant characteristics that they must exhibit in a computerized system designed to retrieve data for user-specified areas: (i) they must be small enough to function as building blocks; (ii) they must be identifiable by a code; and (iii) the location of each one must be unique and specific within an ordered spatial universe.

In urban areas DBS has approached the geographical referencing of data to primary areal units by means of a concept known generally as 'street address conversion'<sup>5</sup>. The logic behind street address conversion as a technique for geographical referencing is as follows: The statistical population for which data are collected may be identified in urban areas by an address (specifically a civic, i.e., municipal, house number form of address, such as 1210 Carling Avenue, Ottawa, Ontario). Addresses are pre-grouped conveniently, in most cases, into address ranges for block-faces<sup>6</sup> of city streets. A block-face is a meaningful areal unit to planners, administrators and researchers in general, and it is usually small enough that it could serve as the primary areal unit of a spatial framework. However, block-faces, while they may be a readily identifiable and discernible element of the street pattern, are not provided with a location-specific identification (i.e., an unique x, y co-ordinate value) on the basis of their address ranges alone. The street name and address of a data observation do not describe the absolute location of the observation within an 'ordered' spatial framework, nor do they indicate relative location with respect to all other data observations.

<sup>5</sup>The street address conversion concept was introduced to the Dominion Bureau of Statistics by members of the Urban Data Centre, University of Washington, Seattle. For the detailed development of the concept see Dial, 1964; Calkins, 1965; Crawford Jr., 1967.

<sup>6</sup>The term 'block-face' is used to designate one side of a street between neighbouring or consecutive intersections. The block-face constitutes the primary areal unit of the system's spatial framework, though on occasion it may be split either to respect the presence of a statistical area boundary or to retain some semblance of an optimum size. 'Address ranges' referred to in this study are the terminal civic house numbers for each block-face or split block-face. Their values are such that they enclose all individual civic house numbers in the primary areal unit.

<sup>3</sup>Dominion Bureau of Statistics, *op.cit.*

<sup>4</sup>*ibid.*







In order for block-faces to function as primary areal units within an automated spatial information system, they must each be provided with a location-specific identification. This latter step is achieved by relating the nominal grid to a geographic grid system, (Transverse Mercator Grid System).

Block-faces may be represented by a point, the location of which in two-dimensional space is expressible as a set of co-ordinate values (x,y) within a geographic grid system. The co-ordinate identification of this point location is unique within the zone of the geographic grid system. The point that is chosen is the mid-point of the long axis of the block-face set back from the street centre line a prescribed distance. This mid-point is termed the block-face 'centroid'.<sup>7</sup> The co-ordinate values for the centroid of the block-face can be used as a code and assigned to each data observation occurring on the block-face, thus identifying the data and simultaneously placing it in an ordered spatial framework. This process is known as creating an Area Master File.

A 'conversion' can be effected between the nominal grid<sup>8</sup> elements (street name and address range by block-face) and the geographic grid<sup>9</sup> element (the centroid of the block-face expressed in co-ordinates). Data bearing a street address identification can be tested by computer against a file of address ranges and corresponding centroid values. Once the appropriate address range has been found for the address in question, its centroid value can be substituted for the data's street address, and the data can be stored on the basis of this newly acquired identification. Geographical referencing or geocoding will then have been accomplished. The process is known as creating an Address Conversion File.

### Spatial Framework

The basic elements of the geographic framework of a street address conversion system are derived from the urban landscape and a geographic grid system. Only those features that would be vital to the development of a spatial framework for the referencing of data, and that would provide attendant plotting and graphic capabilities are abstracted from the urban landscape. It is with reference to these features that the term 'nominal grid' is used in this study. They may be classified as features of the street pattern and as non-street features, such as rivers, railways and area boundaries.

Street Name	Block-face address range	Co-ordinates of block-face mid-point (centroid)		
		(X)	(Y)	(Zone)
Adam St.	1-19	481,209	4,896,212	12
	2-18	481,217	4,896,180	12
... etc.				

The spatial framework for the geographic referencing of data is arrived at through the street pattern<sup>10</sup>. There are two basic elements: (i) portions of streets known as block-face; and (ii) street address ranges for each of these. The nominal grid and the geographic grid are brought together by recording the mid-point or centroid of each block-face in terms of the co-ordinates of the geographic grid and relating all elements in a single address conversion file. See example above.

The centroid code assigned to data observations by means of an address conversion file is the fundamental element of the automated system of geographic referencing of data for subsequent storage and retrieval.

### Plotting and Graphic Capabilities

The nominal grid lends itself to representation in a machine-processable form for both street features and non-street features which, when defined in terms of the geographic grid, permit automated map plotting and computer mapping. An example of computer mapping is shown in Figure 2. Each street feature and non-street feature, identified by name, is coded as a string of points or 'nodes' that sequentially represent terminals, intersections with other features and abrupt changes of direction. Once associated with a geographic grid co-ordinate, each node has a location-specific identification that places it uniquely within an ordered spatial universe and in relative position to all other points described therein. Automatic plotting of features is achieved by connecting node strings by straight lines on the basis of the node co-ordinate values.

The co-ordinate location of centroids is calculated from the geographic co-ordinate values of the nodes that define the block-face; thus, both the establishment of the spatial framework (primary areal units, address ranges, centroids) and the definition of features are achieved by means of a mutual process.

The suitability of the geocoding system for general street mapping by computer at any

specified scale has been demonstrated in program development. The geocoded data base also lends itself to line-printed and more sophisticated computer mapping routines.

### The Block-Face

The block-face is one of two basic elements of the nominal grid; the other being the address range. Earlier in this article, the block-face was identified as the primary areal unit of the spatial framework. Defined in this way, it is understandable that this unit has also been considered as the basic 'building block' of the system, whereby through aggregation, specified areas may be constructed. However, conceptually, the block-face is not so much the building block of the system as is the 'address range'. Two basic functions of the block-face then become: physically containing the address range building block, and providing a convenient mental image or frame of reference with which the address range can be associated. Later in this paper, the repercussions of choosing the block-face as the primary areal unit will be discussed in the context of data retrieval.

The block-face is perhaps most characterized by its lack of standardization. In this respect it is not, at first glance, a very satisfying prospect as the primary areal unit of a spatial framework. However, block-faces are

<sup>7</sup>The 'centroid' is a point location situated at the mid-point of a block-face (or any other primary areal unit) and recessed a standard distance from the street centre line. Its co-ordinate values serve as both a code attributable to all data observations on the block-face, and as a unique location-specific identification for those data observations.

<sup>8</sup>Nominal grid denotes the street pattern and similar linear non-street features such as rivers, railways and boundaries.

<sup>9</sup>Geographic grid refers to a Cartesian grid having a known origin and scaled abscissa and ordinate axes that enable positions on the earth's surface to be reckoned in co-ordinate values.

<sup>10</sup>United States' plans along these lines have taken the form of Address Coding Guide (ACG) and Dual Independent Map Encoding (DIME) programs for the 1970 Census.



generally small areal units that function adequately in conventional information systems and to which administrators, planners and researchers at large can associate their information needs. In addition, the image of a block-face is readily projected, and actual block-faces can be delimited in the field. Figure 3 illustrates the variability of block-face dimensions and orientation.

In an assessment of the usefulness of the block-face it should be pointed out that it is a significant entity within the street address conversion concept only insofar as its statistical population can be identified and expressed in terms of an address range. A block-face whose content is not expressed by an address range, notably as a result of vacant land or parks and possibly also dwellings, does not become a primary areal unit within the system. This situation can be rectified by establishing a pseudo-address range for the block-face and pseudo-addresses for the block-face components.

### The Centroid

The centroid<sup>11</sup> is generally the mid-point of the block-face recessed a standard distance from the street centre line; it may also be the recessed mid-point of a segment of a split block-face. The centroid might better be referred to, conceptually at least, as the 'primary area data point' or perhaps 'coded data point'.

The nature of the centroid within the system is highly conditioned by the characteristics of the nominal grid, notably the street pattern and its block-face components.

The number of centroids is equal to the number of primary areal units (that is, block-faces and block-face segments) for which address ranges are present. The usual system, which calculates a centroid for a primary areal unit in association with an address range, could be modified to calculate a centroid for each and every block-face with or without addresses.

The centroid represents the final abstraction of the urban landscape to the context of the geographic grid, for purposes of geocoding. In effect 'area' is mapped as a 'point', leaving a vacuum surrounding discreet points in place of a continuous spatial surface or plane. Each centroid is a point, having no areal extent. The co-ordinate values of the centroid are simply part of the co-ordinate field of the geographic grid. The centroid is linked to the primary areal unit (be it a

Figure 3 – Block-face Dimensions and Orientation

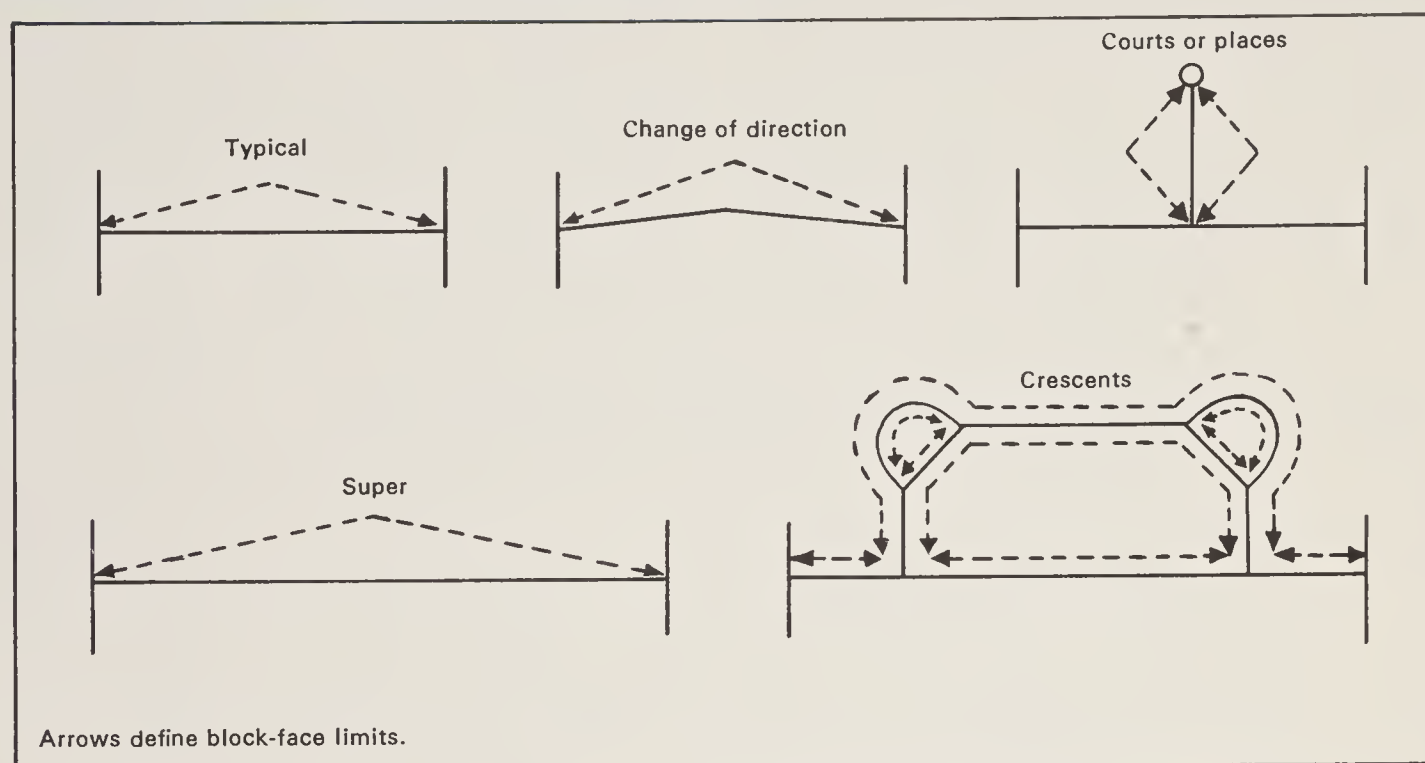


Figure 4 – Variation in Centroid Data Content

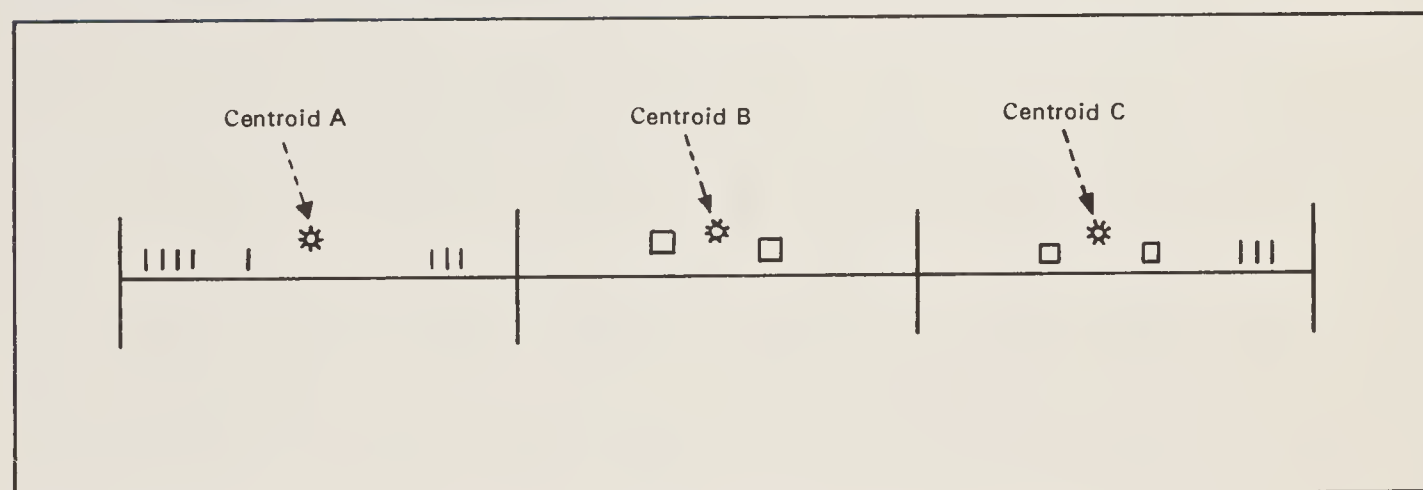
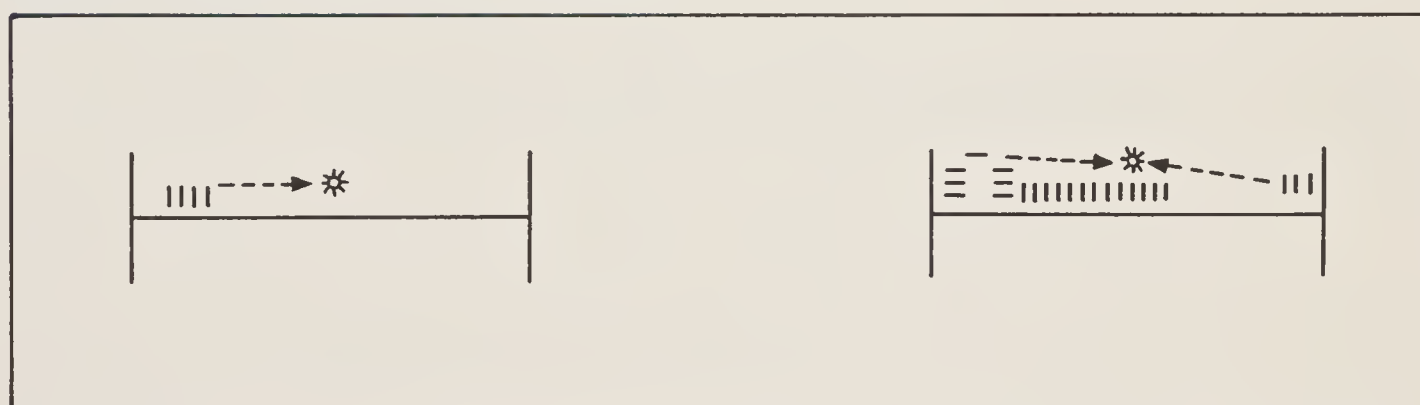


Figure 5 – Data Relocation to the Centroid



block-face or a fraction of a block-face) by an address range expression of that unit.

Centroid data content, that is data attributable to the centroid for data storage, is variable. As Figure 4 illustrates, the data content of a centroid may vary both in quantitative and qualitative terms.

In Figure 4, centroid 'A' is the code and

spatial identification for 8 single-family dwellings; centroid 'B' groups 2 high-rise apartment buildings containing 200 dwellings; and lastly, centroid 'C' groups 2 small apartment buildings and 3 single-family houses for a total of 53 dwellings.

As indicated above, the centroid is the point representation of an area. The reloca-

<sup>11</sup>See footnote 7.



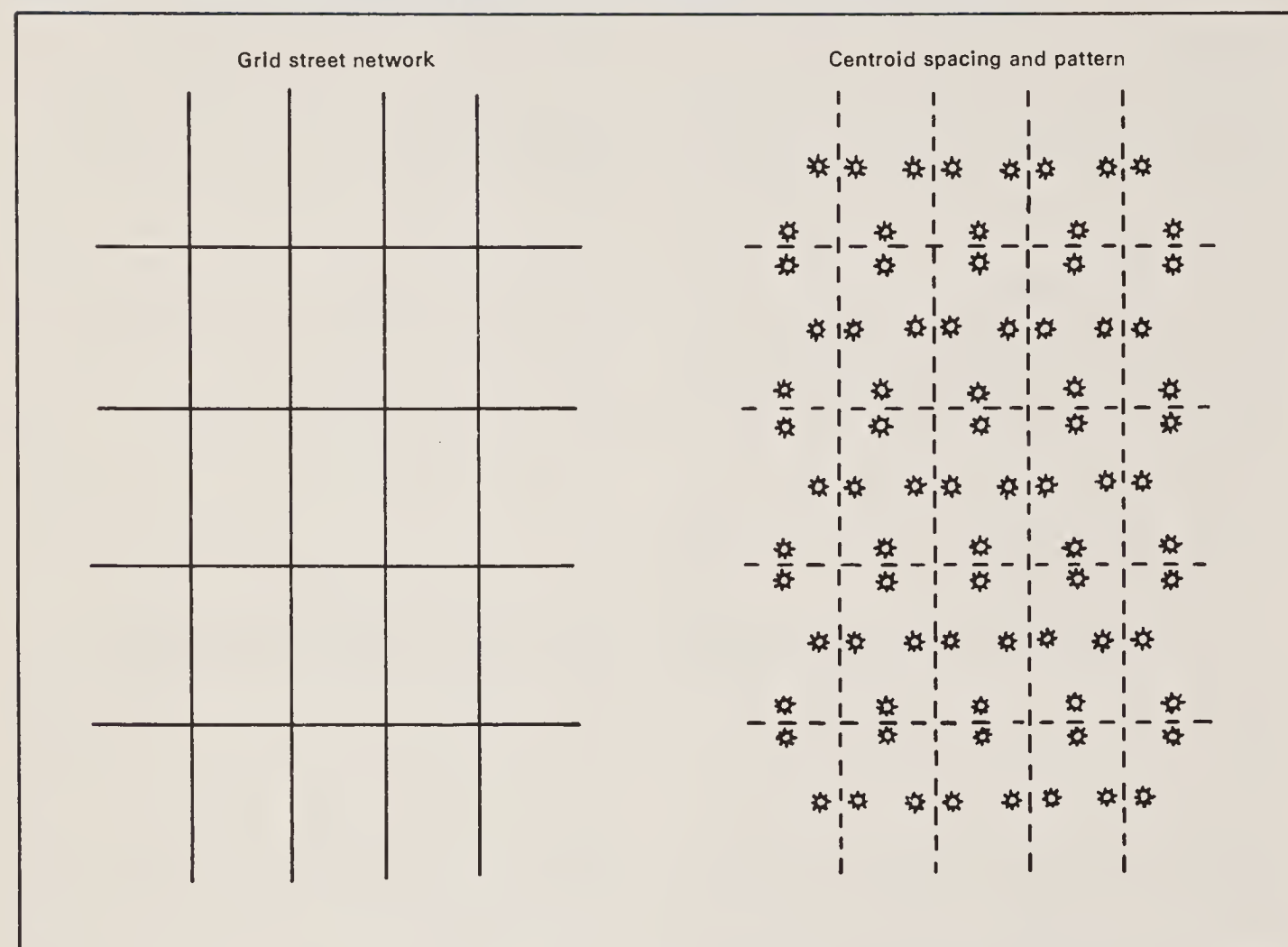
tion of data from its absolute location to a representative point location follows logically. This is shown diagrammatically in Figure 5.

The spacing of centroids reflects the geometry of the nominal grid, specifically the street pattern. A regular grid street pattern (assuming address ranges throughout) re-

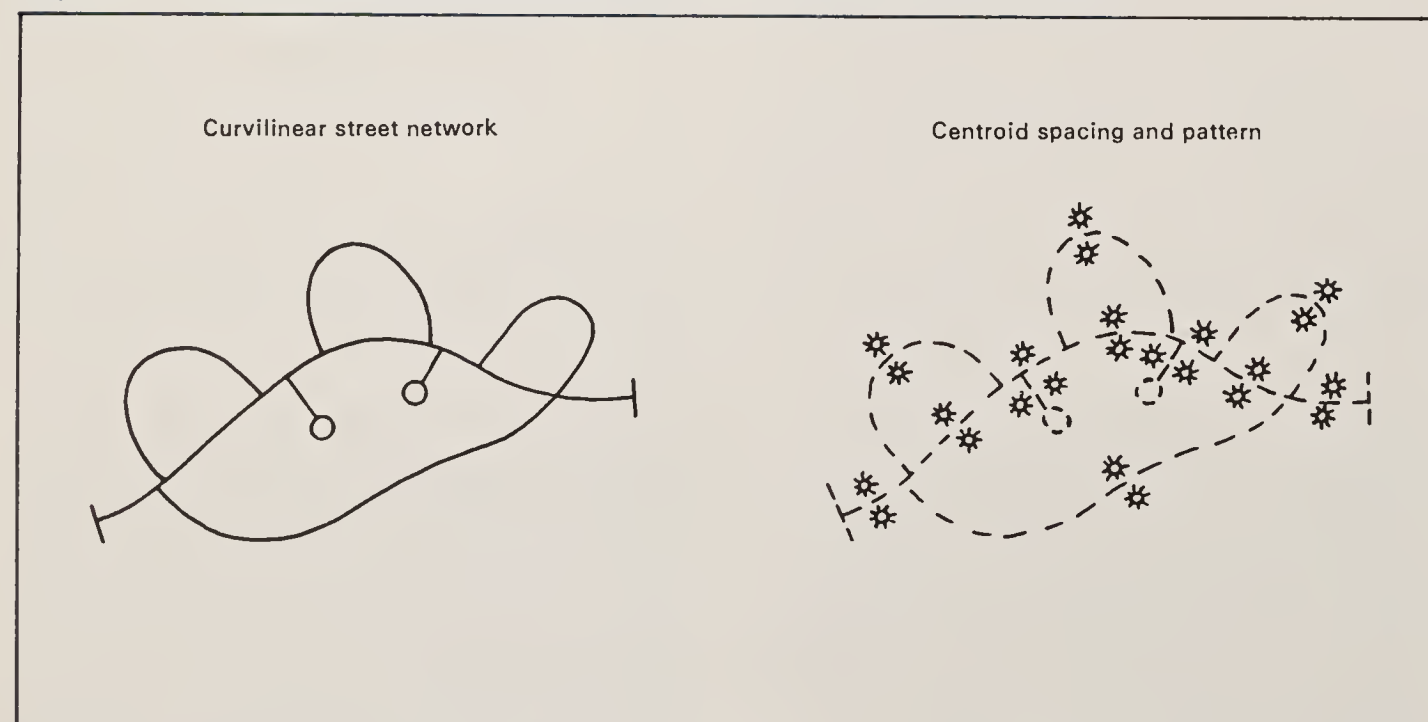
sults in a regular, orderly centroid distribution (see Figure 6).

In irregular street pattern areas the resultant spacing of centroids is less orderly. An example of the distribution of centroids in a curvilinear street area (a type found increasingly in suburban areas and new towns) is shown in Figure 7.

**Figure 6 — Centroid Spacing and Pattern in a Regular Grid Street Network**



**Figure 7 — Centroid Spacing and Pattern in a Curvilinear Street Network**



### The Address Range<sup>12</sup>

In the context of a street address conversion system, address ranges form the fundamental link between the nominal grid elements — the primary areal units (block-faces and fractions of block-faces) and the geographic grid elements — the centroids.

Effectively the address range defines the statistical population that will be ascribed to the centroid. In this capacity, it exercises a discriminating function, permitting address-bearing data to enter the system. Within its values, the address range contains all of the address numbers of a primary areal unit, but nothing is said about the location or distribution of individual addresses within that areal unit. For this reason and the fact that many block-faces do not contain address ranges, it is more accurate to consider the address range (as opposed to the block-face) as the true 'building block' of the system.

While forming a viable link between the primary areal units and the geographic grid, the use of the address range is not without certain disadvantages, most of which can be overcome.

Initially, it is necessary to define an address range for each primary areal unit. Once obtained, such address ranges must be continually checked and updated to ensure that they reflect changes in the street and addressing pattern as the city develops.

A second difficulty arises from anomalies in addressing systems. Though most civic house numbers increase sequentially along a block-face, the system must contend with even numbers occurring within odd address ranges (and vice versa), and occasionally with civic house numbers that cannot be included within a given address range.

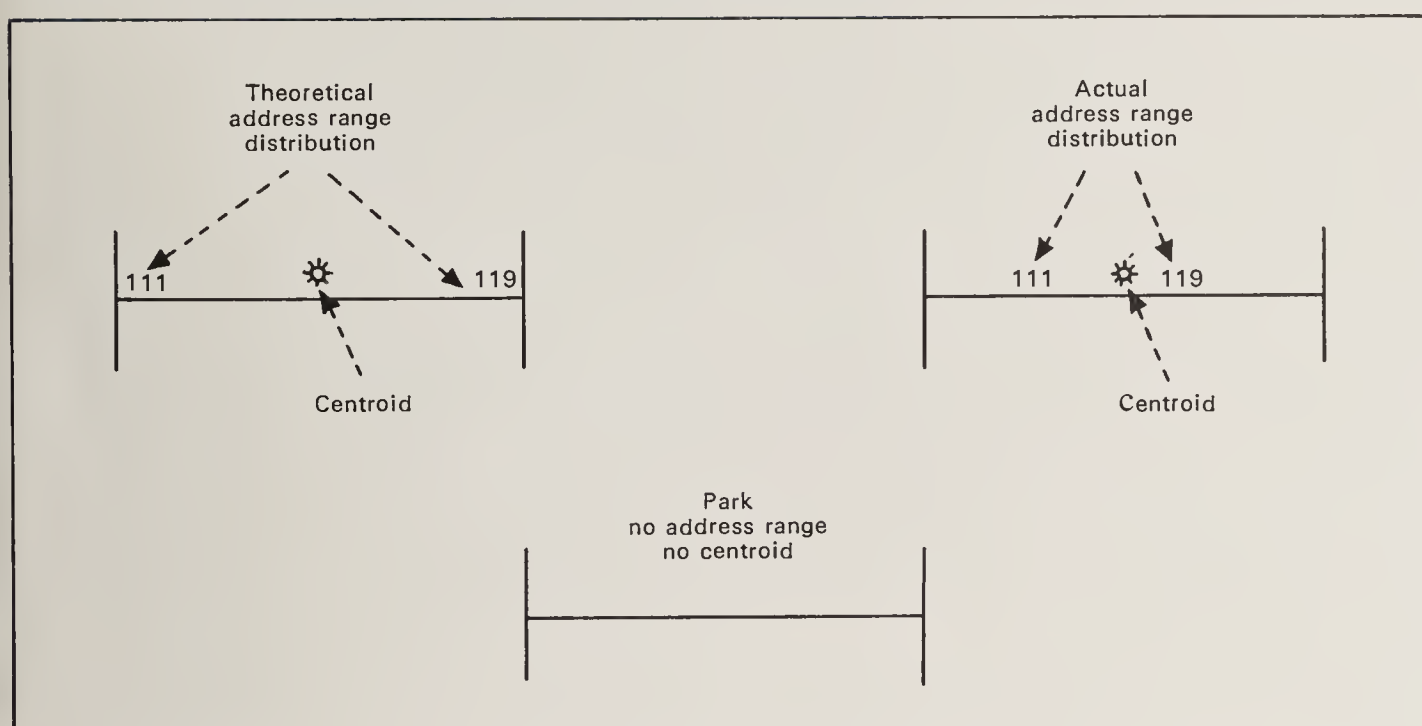
A third difficulty presents itself in the case of dwellings (or any other statistical population) that do not bear an address. Such a situation is infrequent in large urban areas, and can be resolved by providing a 'pseudo' address for each occurrence.

The disadvantages, mostly operational in nature, of the address range are minor in comparison with the major advantages of its widespread use. More specifically, individual addresses are used extensively by many government agencies and private firms to identify information on statistical populations. Since any data identified by an address can be accorded a centroid value, the data storage design can be 'open-ended' to include additional survey data.

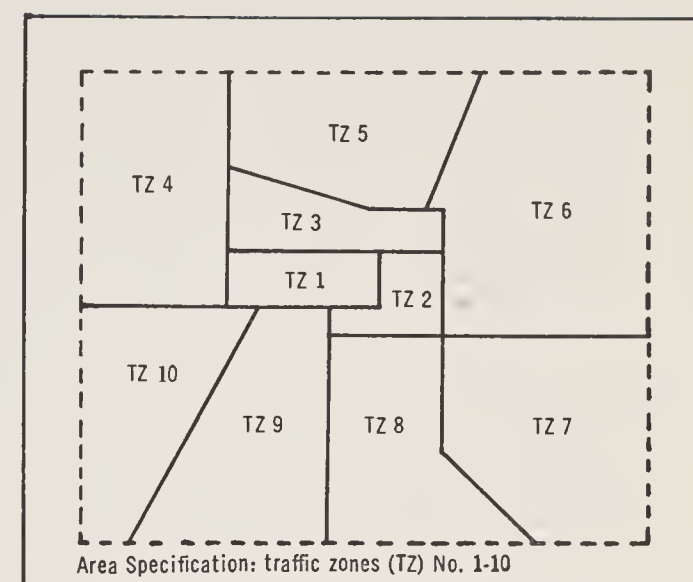
<sup>12</sup>See Footnote 6.



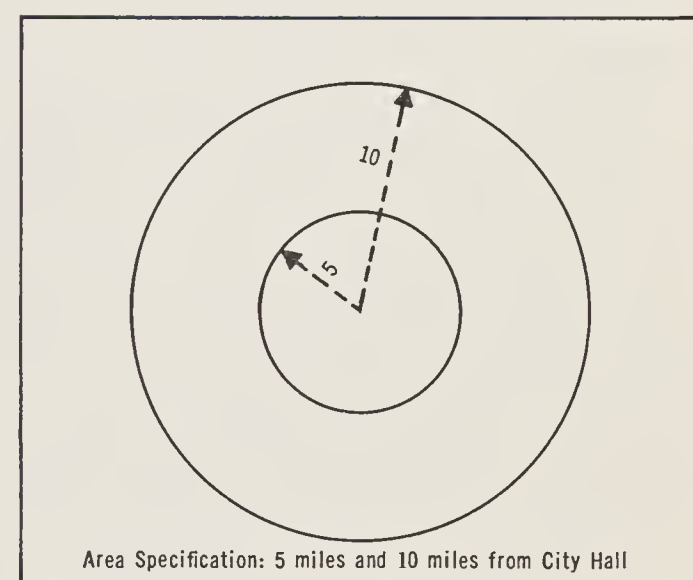
**Figure 8 — The Address Range in Terms of the Block-Face**



**Figure 9 — User-Specified Areas: Polygonal**



**Figure 10 — User-Specified Areas: Concentric**



### Analytical Aspects of Data Storage and Retrieval

A geocoded census data base may be viewed conceptually as one large storage file, although this file may be split into sub-files.

The data observations derived from a census or other questionnaires will be kept separate for each member of the statistical population. The members of the statistical population will be arranged within the geocoded data file in terms of their position within their primary areal unit. Although they are kept discreet for purposes of cross-tabulation of characteristics, all members of the statistical population (and their associated characteristics) are 'grouped' under the centroid of the primary areal units in which they are situated. The orderly arrangement of the primary areal units themselves within the census data file will be according to the co-ordinate values of their respective centroids.

Since a geocoded data file may be conceptually viewed as one large file structured geographically on the basis of the co-ordinate values of centroids, the primary areal units determined under an urban system of geocoding will merge with those primary areal units (of a different nature) designated within a rural geocoding system.

The ordering of primary areal units within the geocoded data file on the basis of their 'centroid' co-ordinate values has a number of advantages at the data retrieval stage.

Any request for data from users must incorporate four elements; statistical population, variable(s), time and space. The geo-

coding system has been designed primarily to contend with the spatial dimension discernible in any user request. In a narrower sense, it has been designed to allow for data retrieval by specified areas of sub-municipality size. The system seeks to provide tabulations for 'ad hoc' areas specified by the user by collecting the data of the individual finely-gauged primary areal units to form the requested aggregation.

Areas specified by users are expected to fall into four main categories: (i) bounded areas or 'polygons'; (ii) concentric zones or distance bands; (iii) street-oriented areas and, (iv) uniform data regions.

Figure 9 presents an example of a polygon request in which the 'area specification' called for data tabulation by traffic zones one to ten.

Other examples of bounded polygon sets might include school districts, planning neighbourhoods, wards and police districts.

**Figure 11 — User-Specified Areas: Street-Oriented**

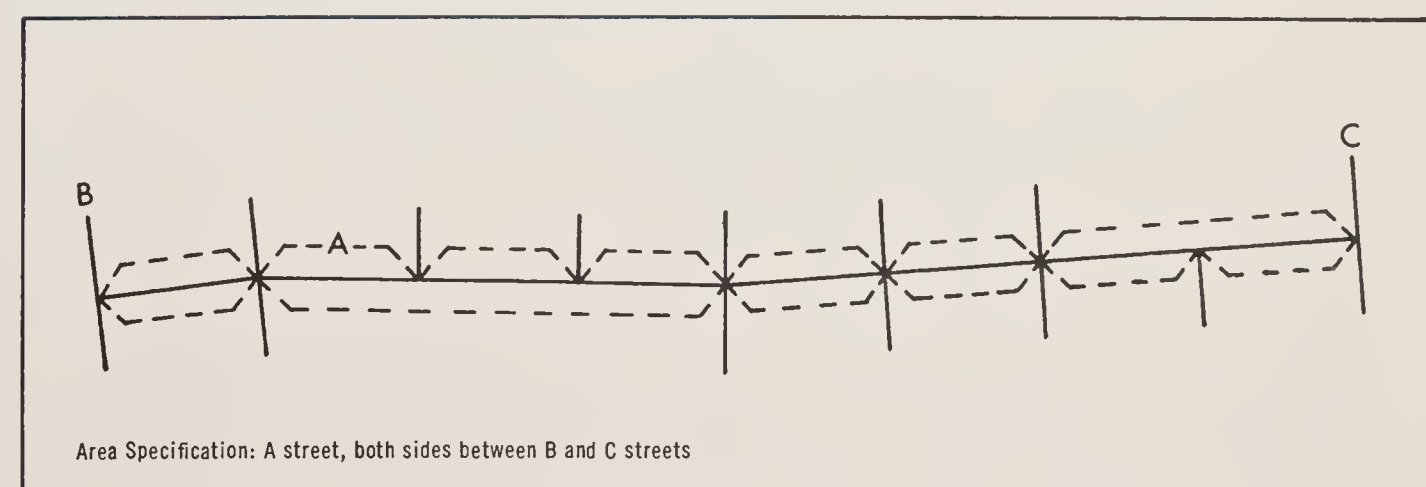


Figure 10 illustrates a request for data tabulations by concentric zones, as defined by radii from a central point.

Figure 11 illustrates the specifications of a request for data for both sides of a street between specified intersections.



**Figure 12 — User-Specified Areas:  
Uniform Data**

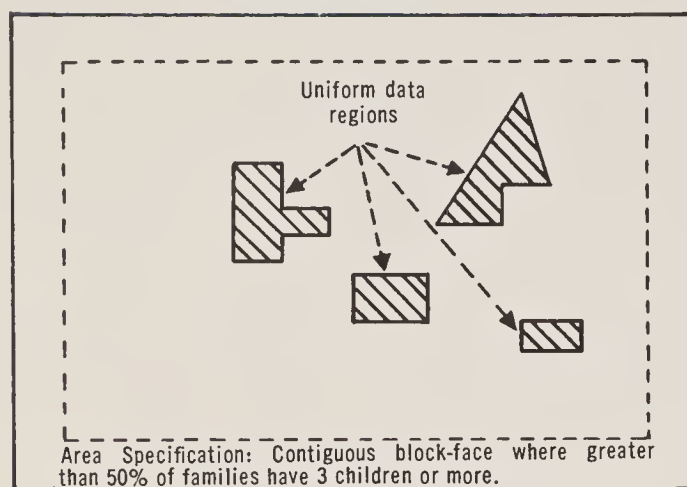


Figure 12 illustrates a form of areal retrieval that may ultimately be practical, i.e., retrieval of tabulated data and regional delimitation based on homogeneous characteristics.

The suitability of the block-face and split block-face as primary areal units in the construction of areas specified by users will vary according to the type of area specification submitted by the user.

The general approach to data retrieval defines the boundaries of user areas in terms of the geographic grid, and subsequently searches the file of centroids using a point-in-polygon geometric algorithm to determine which of the co-ordinate values of the cen-

troids are 'inside' the defined areas. The data coded with the centroids found to lie inside the defined areas are tabulated in accordance with the user's specifications.

One final note on data retrieval should be made. Primary areal units, being small and containing a variable statistical population content may present problems, even in aggregation, in terms of maintaining confidentiality and/or of exhibiting a high sampling and non-sampling error. In the former case, suppression of data would be required in accordance with the regulations of the Statistics Act and, in the latter case, an estimate of such errors might have to be provided with the tabulations.

#### Summary

Those elements of the street address conversion node of geocoding for urban areas that might be considered as geographic in nature have been identified as the block-face, the centroid and the address range. The block-face and the address range have been construed as elements of a nominal grid that functions as a spatial framework for referencing data. However, as the nominal grid is an imperfect tool with which to determine either relative or absolute location, it is merged with a geographic grid system by providing each primary areal unit of the nominal grid with a centroid, or co-ordinate location within the geographic grid.

The block-face, block-face centroid, and block-face address range elements have each been examined in detail in order to describe the role that they play in a street address conversion system and to determine the manner in which their characteristics effect the attainment of geocoding system objectives. The study reveals that the address range may be considered the real building block of the spatial framework, although the block-face serves to contain this range physically and to convey a convenient mental image of it. The centroid, however, is the most fundamental element of the operational system. Expressed in geographic co-ordinates, it serves as a code attributable to data observations for the block-face in question and as a unique location-specific identifier for those observations. The Cartesian relationship of centroid co-ordinates permits data for all block-faces to be stored in a single randomly accessible data base, for subsequent aggregation by block-face to satisfy user requests for data by non-standard areas.

In this study the geographic elements of the system have been shown to underpin the entire system concept. Therefore, it seems reasonable to conclude that the development of any spatial information system should include fundamental research into the nature of the spatial framework that ultimately will affect the utility of the system.



# Selected Economic Indicators

## Leading Indicators





## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

\$ Billion  
\_30  
\_25  
\_20  
\_15  
\_14  
\_13

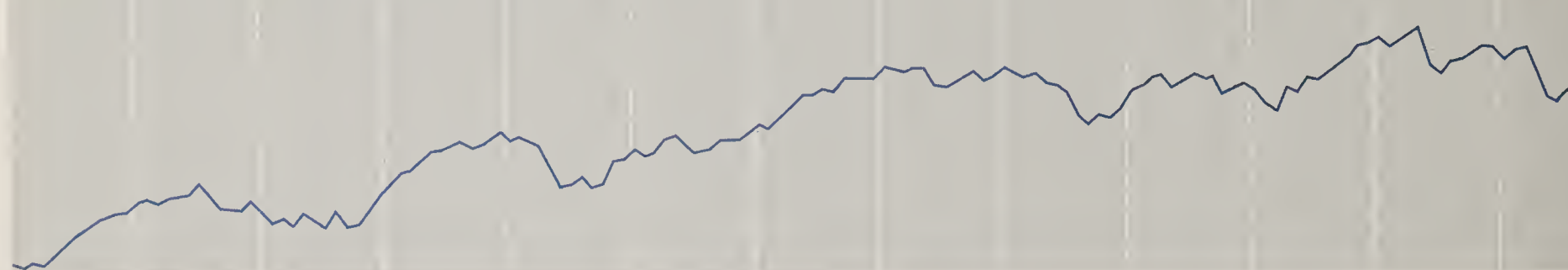
Scale L1



**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Index  
\_200  
\_180  
\_160  
\_140  
\_120  
\_100

Scale L2



## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion  
\_80  
\_70  
\_60  
\_50  
\_40  
\_35

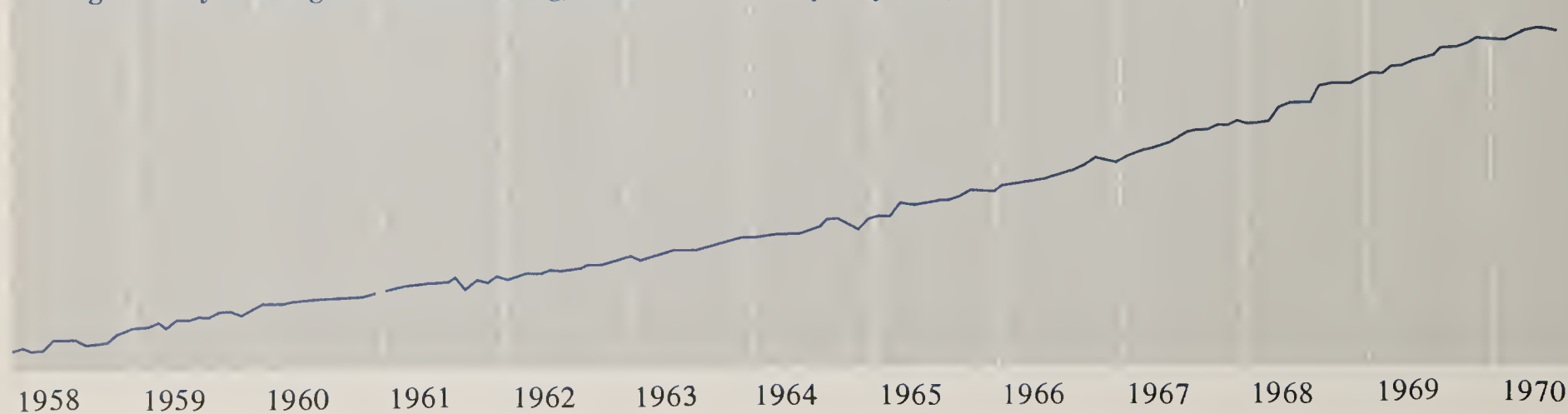
Scale L1



**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

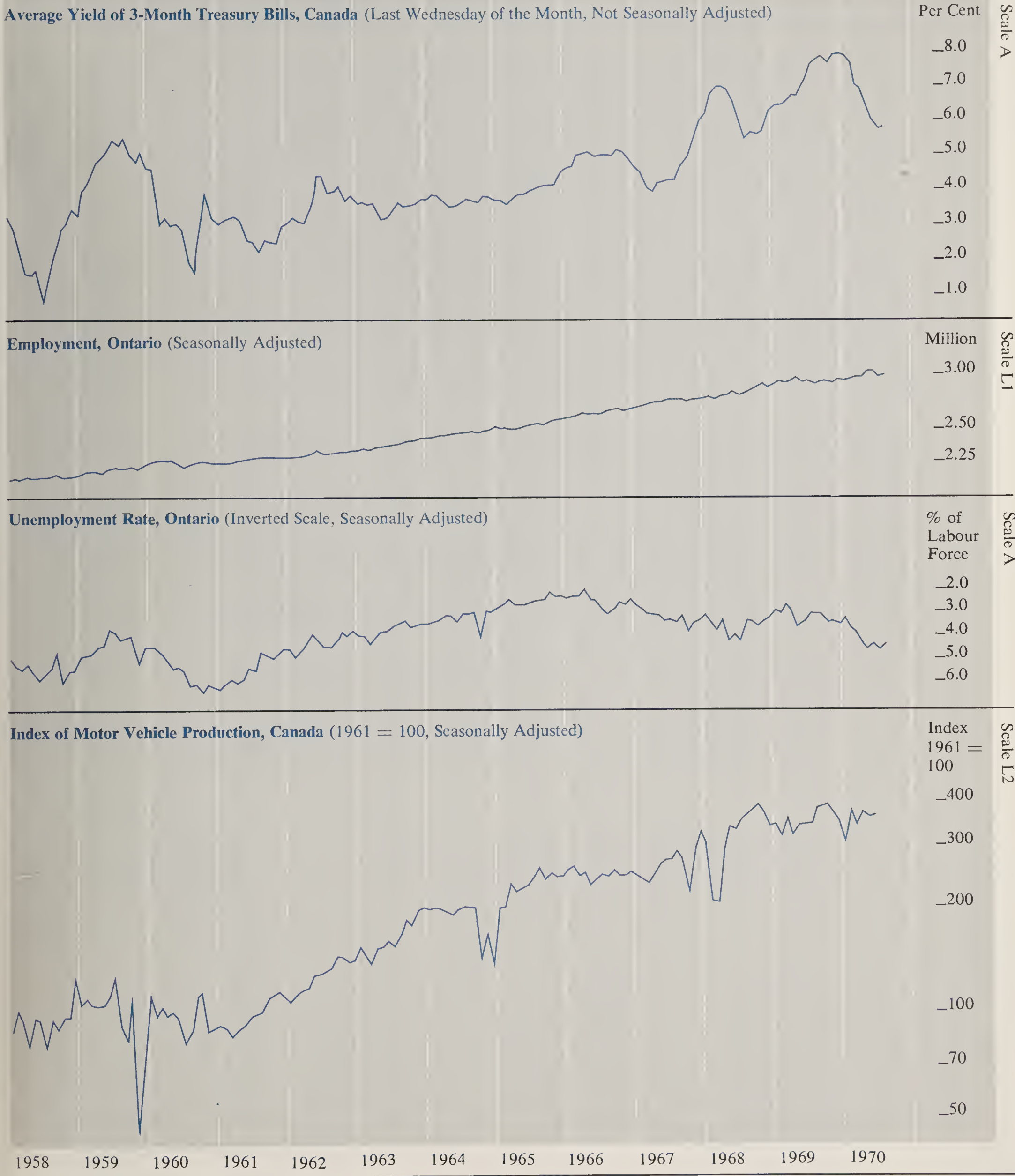
Dollars  
\_3.00  
\_2.50  
\_2.00

Scale L1





# Coincidental and Lagging Indicators





# Economic Indicators

Seasonally Adjusted

	1970													
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.
Leading Indicators														
Average Weekly Hours Worked in Manufacturing	40.2	39.6	40.3	39.9	39.9	38.4	39.6	39.7	39.5	40.0	40.3	40.4	39.5	
New Orders in Manufacturing Industries <sup>c</sup>	3,741	3,690	3,770	3,634	3,754	3,728	3,662	3,696	3,604	3,650	3,654	3,679		
Commercial/Institutional and Industrial Construction Contracts	144.0	127.0	123.2	86.6	137.3	140.0	72.1	78.4	87.2	142.2	97.4	130.4		
Urban Housing Starts (Annual Rate)	60,800	69,300	67,300	78,300	59,100	64,700	34,800	33,600	55,700	53,900	37,200	45,200	67,500	77,700
Money Supply <sup>c</sup>	28,324	28,292	28,403	28,472	28,580	28,917	28,955	28,947	28,817	28,966	29,223	29,668	29,769	29,996
T.S.E. Industrial Index <sup>u</sup>	168.65	175.43	178.15	182.11	187.65	186.37	177.89	183.92	185.17	171.08	154.21	151.53	157.36	160.28
Business Failures <sup>u</sup>	32	51	52	64	54	53	56	71	82	54	65	77	73	
Business Failures — Liabilities <sup>u</sup>	0.9	2.6	4.8	3.4	4.6	2.2	9.9	18.7	4.0	2.2	3.4	8.1	3.1	
Coincidental and Lagging Indicators														
Gross National Product <sup>c</sup> (Annual Rate)			79,292			80,888			82,660				83,192	
Average Hourly Earnings in Manufacturing														
3-Month Treasury Bill Rate <sup>c,u</sup>	2.94	2.97	2.97	2.99	3.02	3.06	3.06	3.05	3.11	3.16	3.19	3.18	3.14	5.51
Cheques Cashed in Clearing Centres <sup>1</sup>	7.62	7.69	7.77	7.60	7.76	7.81	7.78	7.60	7.00	6.78	6.34	5.94	5.70	
Retail Trade	6,458	6,560	6,570	6,526	6,521	6,240	6,078	6,099	6,661	6,487	6,313	6,386	6,358	
Labour Force	884	886	901	892	895	909	891	869	884	906	904	887	918	902
Employed	3,028	3,004	3,027	3,035	3,030	3,064	3,044	3,066	3,098	3,111	3,183	3,173	3,122	3,130
Unemployed	2,935	2,910	2,932	2,930	2,927	2,957	2,948	2,957	2,981	2,977	3,037	3,038	2,976	2,992
Unemployed as % of Labour Force	93	94	95	105	103	107	96	109	117	134	146	135	146	138
Wages and Salaries	3.1	3.1	3.1	3.4	3.4	3.5	3.2	3.6	3.8	4.3	4.6	4.3	4.7	4.4
Index of Industrial Employment	1,446	1,447	1,457	1,460	1,487	1,503	1,529	1,549	1,550	1,547	1,570	1,573		
	129.6	129.3	129.6	130.7	132.7	132.8	132.1	133.0	132.7	132.1	131.7	131.4	131.4	
Index of Industrial Production <sup>c</sup>														
Total Manufacturing <sup>c</sup>	166.8	164.5	165.9	165.6	169.3	172.0	171.1	174.4	171.5	172.4	170.5	171.2	169.7	170.2
Non-Durables <sup>c</sup>	169.3	166.5	166.8	166.7	169.5	170.7	167.8	171.0	168.1	170.0	167.5	167.4	165.1	165.4
Durables <sup>c</sup>	151.6	152.5	153.0	152.4	153.4	154.3	152.3	154.3	152.8	154.8	155.0	152.4	151.8	151.2
Mining <sup>c</sup>	191.0	183.7	183.8	184.1	189.2	190.7	186.8	191.4	186.7	188.6	182.8	185.8	181.4	182.9
Electric Power and Gas Utilities <sup>c</sup>	138.9	136.2	141.8	140.3	151.8	163.4	170.2	175.7	170.6	164.2	166.6	170.8	171.6	174.0
Primary Energy Demand (Annual Rate)	189.0	190.1	194.6	195.5	194.6	197.0	201.0	203.0	203.0	206.4	203.7	205.0	206.3	205.9
Exports (including re-exports) <sup>c</sup>	60.28	58.83	58.39	59.09	59.56	63.13	64.53	63.91	62.94	63.39	61.60	63.35	65.03	65.68
Imports <sup>c</sup>	1,196.0	1,161.7	1,293.4	1,283.0	1,285.0	1,328.9	1,447.0	1,403.0	1,410.0	1,439.0	1,434.1	1,448.4	1,391.3	1,322.0
	1,124.2	1,136.3	1,220.1	1,206.7	1,223.2	1,215.0	1,116.8	1,230.6	1,242.6	1,191.6	1,207.1	1,182.5	1,185.3	1,157.0
Unclassified Indicators														
Foreign Exchange Reserves <sup>c,u</sup>	2,565	2,594	2,539	2,629	2,613	2,616	2,698	2,777	2,936	3,179	3,406	3,650	3,689	3,848
Industrial Materials Price Index <sup>c,u</sup>	270.5	269.2	270.4	266.8	267.8	271.5	272.3	272.3	275.7	274.4	273.7	271.5	272.3	
Consumer Price Index <sup>c,u</sup>	126.4	126.9	126.6	126.8	127.4	127.9	128.2	128.7	128.9	129.7	129.6	129.9	130.5	130.5

<sup>c</sup>Statistics for Canada.  
<sup>u</sup>Not seasonally adjusted.  
<sup>1</sup>Ontario less Toronto.



HA/747/.0656  
Ontario. Dept. of Economics and  
Ontario economic review

Sep/Oct

gmwg

c.1

1970

BAS









# Ontario Economic Review

---

Nov/Dec 1970  
Volume 8, Number 6

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister

---

HA  
747  
.0656

1970  
Nov/Dec  
c.1 BAS



# Ontario Economic Review

November/December 1970

Volume 8, Number 6

## The Ontario Economy

1

## The Development of Ontario Economic Accounts

5

M. V. Chari and R. H. Frank

Department of Treasury and Economics

## Selected Economic Indicators

18

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. Charles S. MacNaughton  
*Treasurer of Ontario and  
Minister of Economics*

H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

### About The Review

The November/December edition of the *Ontario Economic Review* presents an article on the methodology underlying the development of a comprehensive set of economic accounts for Ontario comparable to the National Accounts. Provincial economic accounts constitute an invaluable tool for quantitative economic analysis and provide the indispensable data base for the development of an econometric model for the province.

The first section of the article outlines the conceptual framework of the Ontario accounts, while the second part of the study provides a concise exposition of the estimation procedures employed. The final section presents a description of the sectoral accounts and their structural interrelationships. Annual estimates of the major components of Ontario Provincial Product for the period 1957-1969 are presented in the Appendix.

This article was prepared by Dr. M. V. Chari and Mr. R. H. Frank, Director of the Economic Analysis Branch. Dr. Chari is Professor of Economics at McMaster University and has been associated for the past two years with the Economic Analysis Branch of the Economic and Statistical Services Division as a research consultant. The authors acknowledge with appreciation the contribution of Mrs. P. Fromstein, Senior Economist with the Provincial and Regional Accounts Section.

### Indicator Charts, Pages 18-20

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 18-20 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## THE ECONOMY IN TRANSITION

This has been a year of economic adjustment for Ontario and Canada during which policies to counter inflationary pressures have produced some positive results, but the effects have been cushioned by the extraordinary strength of export sales. The strategy of both the federal and provincial authorities has been to move away from the over-strained conditions of 1968-69, through a rather extended transitional period, and on finally to a more desirable state of non-inflationary long-term growth. Implicit in this strategy was a slowing down of production and employment and the opening-up of a margin of unused capacity in the economy.

At the national level, this change of pace began to show through in the second half of 1969, although the trend during this period was far from clear due to serious strike interruptions. In the first quarter of 1970 a recovery of this lost output, together with the attainment of a record surplus on external trade, kept production from going into a decline. However, it was apparent at the outset of the year that the rates of growth of production and employment were slowing; construction work had already begun to slide off, and a distinct softening in consumer spending and business capital investment was beginning to appear.

By mid-year the purchase of consumer durables had fallen off by over 5.0 per cent compared to the similar period last year. Declining rates of growth in personal income after taxes, tighter credit, lower rates of housing completions, a disappointing stock market performance and general consumer uncertainty contributed to the fall in consumer expenditures on durables. During the first half of 1970 sales of furniture, appliances and radio and television sets through retail outlets were 3.8 per cent below comparable 1969 levels.

Business outlays for plant and equipment declined slightly in the first half of 1970, affected by prolonged strikes in the construction industry, as well as tight money conditions and the contraction in cash flows as the result of lower corporate profits. This decline largely reflected lower spending on machinery and equipment. Earlier this year official estimates indicated that total machinery and equipment demands in 1970 would rise by approximately 8.0 per cent. However, the mid-year survey released by DBS in August, indicated that corporations, institutions and governments in Canada planned to increase

machinery and equipment purchases this year by 11.0 per cent. The statistical evidence for the first half of 1970 suggests that the Canadian market has failed to grow at the pace outlined by the survey. In fact, this year may witness the largest ever discrepancy between actual and intended business investment.

If corporate reports of intentions to purchase machinery are credible, then demands in the second half must rise substantially. However, it is highly unlikely that the increase will be strong enough to bring about an 11.0 per cent rate of growth. An increase this year of approximately 5 to 6 per cent in total demand seems more probable and even an increase of this magnitude implies substantial demand strength in the last half.

Much of this year's intended investment was for labour-saving equipment which, though postponed this year, will probably be installed next year when easier credit conditions and the subsidence of some inflationary pressures as well as construction strikes clear the way for a resumption of higher levels of capital spending. Moreover, as hourly wage and salary costs continue to rise at unsustainable rates, it is apparent that corporate expenditures on machinery and equipment will become even more attractive. During July, August and September wage settlements indicated an average annual increase in base rates of 9.5 per cent according to recent information issued by the federal Department of Labour. The settlements analysed cover bargaining units of 500 employees or more with the exclusion of the construction industry.

One area where investment and employment conditions may improve is the agricultural machinery industry in Ontario.

After several years of disappointing export sales, lower prices and mounting stocks, the prospects for Canadian wheat now look sharply brighter. The new sales agreement with China, the recently announced sales to Algeria and the generally improved outlook for expanding exports of Canadian wheat and barley may cause a new optimism on the prairies which could lead to improved sales in farm machinery.

The agricultural implements industry in Ontario has been depressed recently with employment levels running approximately 25.0 per cent below those of 1969. This industry which employed about 6,500 persons in Ontario in June 1970 is not one of the larger in the province, but has been of particular con-

cern because its activity in the past few years has been considerably less buoyant than most of our other manufacturing industries. Moreover, since a major concentration of activity in this industry exists at Brantford, the economy of the city is closely tied to the performance of this sector.

Recent performance has continued to be poor. Sales of farm implements and equipment in Canada for the period January to August 1970 amounted to \$206.4 million, a decrease of 18.2 per cent from the \$252.5 million attained in the corresponding period in 1969. Much of this decrease is due to the cutbacks in acreage of western wheat under the federal Operation L.I.F.T. Program (Low Inventories For Tomorrow) and the resultant poor economic position of western farmers.

However, the new export agreements in addition to the reduced 1970 wheat crop have prompted the Hon. Otto Lang, the federal minister responsible for the Wheat Board, to announce that Operation L.I.F.T. may not be necessary next year. These factors may also lead to some improvement in farm equipment sales, and hence employment in the farm machinery manufacturing industry.

Implicit in the Government's strategy to combat inflation was a gradual shift towards easier official policies as soon as a distinct slowing in the economy emerged. By the second quarter of this year definite signs of a moderating pace were evident. Although wage settlements continued to be high, wholesale price inflation was slowing, perhaps because of the program of voluntary price restraint. The unemployment rate which had been climbing steadily since the beginning of the year reached a seasonally adjusted level of 6.2 per cent for Canada and 4.6 per cent for Ontario in May. In addition, the Consumer Price Index which had been rising at an annual rate of 4.2 per cent since January dropped to an annual rate of 3.2 per cent in June.

Recognizing the turning of the tide and the inevitable lags between policy action and market response, the Canadian authorities began gradually to shift away from their previous policies of restraint to measures aimed at forestalling any extended slowdown and at encouraging a moderate re-expansion. In mid-May, the first overt hint of a policy shift was signalled by a lowering of the bank rate from 8.0 to 7.5 per cent. Upon the floating of the exchange rate at the end of May, the bank rate was again reduced from 7.5 to



7.0 per cent and at the first of September there was a third cut to 6.5 per cent. This was followed early in November by an additional reduction in the official lending rate to 6.0 per cent. During the period from April to June the rate of increase in money supply (currency outside banks plus total bank deposits) rose to nearly 12.0 per cent (seasonally adjusted annual rate) and since then has been increasing at approximately 6 to 7 per cent.

The shifting monetary policy plus federal outlays for the wheat adjustment program, for housebuilding and grants to provinces as well as added unemployment assistance combined to prevent a serious downturn.

Primarily due to the strength of Canada's export sales, but also because of increased government expenditures, real output at mid-year was roughly 2.0 per cent higher than a year earlier. This, in turn, tended to limit the slowing of Canadian incomes and profits. In spite of these stabilizing influences incomes did slacken through the first half of the year and consumer spending was characterized by caution and restraint. As pointed out previously, housebuilding showed a fairly similar decline and the pace of business capital expenditures fell well short of announced intentions. Through the summer the overall production trend flattened as export performance tapered off and in mid-September the balance was tilted downward by the automotive strike at General Motors.

The biggest single factor affecting the Ontario labour market in the second half has been the dispute between General Motors and the United Auto Workers. At time of writing over 25,000 men and women in Ontario were not working because of the strike and of these, nearly 5,000 were not employees of General Motors. A total of almost fifty different companies are directly or indirectly involved in the stoppage. One interesting aspect of the strike reported by Canada Manpower Centres was the significant increases in married women (the wives of workers on strike or locked out) entering the labour force to seek jobs which would supplement the strike pay or unemployment insurance their husbands received.

It is also of significant interest to note that a study of the record of work stoppages throughout the postwar period reveals that no single strike or combination of strikes — with the sole exception of the extraordinary 116-day steel strike in the United States in

1959 — seems to have had more than transitory effects on the shape of the general business curve. While general activity may be significantly affected for a short time, strike-period losses usually are pretty much balanced out by make-up production and sales in the period following settlement. There is no reason to suppose that this won't be the pattern again in the case of this year's automobile shutdown.

What a major strike can do, of course, is to blur trends markedly, both during the time it lasts and immediately after it is over. Since the United Auto Workers' strike in Canada has now lasted over two months, it may well be early in 1971 before it will be possible to judge whether recovery in the economy at large has begun.

Preliminary estimates of Gross National Product in the third quarter recently released by DBS indicate modest improvement in activity but confirm that in recent months the Canadian economy has been going through a sluggish period of adjustment. During the third quarter GNP rose by 1.3 per cent or one billion dollars to an annual level of \$84.1 billion. This was a better gain than the increase of one-half of one per cent in the second quarter, but well below the average quarterly rate of increase of approximately 2.2 per cent experienced in the last few years. After accounting for rising prices, the gain in volume of production amounted to 0.4 per cent. This compares with a marginal constant dollar decline of 0.1 per cent in the second quarter and with an 0.8 per cent increase in the first quarter.

The acceleration in economic expansion in the third quarter appeared more due to a modest recovery in total fixed capital formation than to notable strength in any major component of demand. But in spite of a moderate gain of \$264 million, spending in this sector for the first nine months of the year was still running at a level considerably lower than the anticipations for 1970 as reported in the mid-year survey of intentions.

Consumer expenditure on goods and services, the other sector that showed persistent weakness in the first half of the year, rose somewhat faster in the third quarter and made the major contribution to total demand. However, the largest percentage gain occurred in government expenditure on goods and services, which, with a 2.0 per cent increase, continued to be an important source

of support to the economy. Offsetting these increases to some extent, exports of goods and services fell by \$312 million from the very high level of over \$21.1 billion achieved during the first quarter and maintained through the second quarter. The decline of 1.5 per cent was entirely caused by lower merchandise exports to the United States and the United Kingdom; service exports rose by 2.2 per cent, largely due to higher interest and dividends receipts.

Merchandise imports also declined in the third quarter, by 1.8 per cent, in spite of an increase in imports of machinery and equipment. According to DBS increased service imports, paced by travel payments, offset the decline in merchandise, leaving total imports only marginally higher than in the second quarter. The net result of external transactions was to lower the surplus with non-residents, on a national accounts basis, from \$1,056 million to \$720 million.

#### **Distribution of Manufacturers' Shipments, 1967**

Canadian producers shipped 56 per cent (by dollar value) of their products to destinations within their own province, 28 per cent to destinations in other provinces, and 16 per cent to foreign countries in 1967. This relationship has been established for the first time in a survey conducted by the Dominion Bureau of Statistics.

The study of shipments from manufacturer-to-manufacturer and manufacturer-to-wholesaler adds a new dimension to comparisons of provincial economies. For example, Ontario's shipments (valued at \$20,025 million and representing 52 per cent of the national total) followed the national pattern very closely — 58 per cent to destinations within the province, 28 per cent to other provinces and 14 per cent to foreign countries. Quebec's shipments (\$10,790 million — 28 per cent of the national total) were also close — 54 per cent within the province, 30 per cent to other provinces, and 16 per cent to foreign countries. But Newfoundland, with shipments valued at \$184 million (0.5 per cent of the national total) kept 38 per cent of its shipments within its borders, sent 2.0 per cent to other provinces and exported 60 per cent, while Saskatchewan (\$470 million and 1.2 per cent of the national total) kept 74 per cent within the province, sent 22 per cent to other provinces and exported only 4.0 per cent.



### Tax Reform and Small Business

A new incentive for small business, which would provide personal tax relief for Canadian owner-operators, was proposed by Ontario Treasurer Charles MacNaughton at the recent federal-provincial meeting of finance ministers in Ottawa.

The Ontario plan, which would replace the present dual rate of corporation income tax, would give a tax credit of up to \$10,000 annually to any Canadian who invests capital, to start or expand his own business, whether alone or with other Canadians. An entrepreneur would receive a personal tax reduction equal to 50 per cent of his increased investment in any one year. The proposed tax reduction would be limited to one-half of his personal tax liability or to \$10,000 annually. Lifetime limit would be \$100,000.

Mr. MacNaughton said the plan offers greater encouragement to Canadian entrepreneurs and more flexibility for business developments than either the present lower corporation tax rate or proposals advanced by the Commons and Senate committees on tax reform.

The Treasurer suggested the effect of his proposal would be to provide interest-free loans for small-business investment. The tax loans would be recovered on death, emigration or withdrawal of investment, but rollover provisions would permit re-investment and avoid lock-in problems. By being based on investment, the tax incentive would be available to both old and new businesses. The benefit would not be delayed until the investment returned a profit, thereby providing assistance during the most difficult period of a business development.

Unlike the lower corporation rate, the incentive would not be restricted to incorporated businesses. Entrepreneurs could qualify as a proprietorship or in a partnership, as well as in an incorporated firm. The tax credit would not be available to non-residents, passive investors or corporations.

The small business proposal was tabled in two separate documents — one discussing the best means of promoting entrepreneurship in Canada, the other concentrating on administrative aspects of the specific Ontario proposal. This totals five comprehensive documents which Ontario has contributed to the debate on national tax reform. The series began with a study of the revenue effects of the proposed federal reforms and a compre-

hensive set of Ontario proposals both published in June 1970, followed by an analysis of the Ontario proposals which was recently released.

The small business incentive proposal reflects Ontario's conviction that national tax reform must encourage economic development and should help Canadians develop their own business operations. While not discriminating against foreign investment in Canada, the incentive focuses on development of the Canadian economy by Canadians.

Mr. MacNaughton listed many advantages of his proposal. However, he acknowledged it is a new tax plan which has not been tested in any other country. Accordingly, he urged that the proposal receive extensive review from both federal officials and organizations such as the Canadian Bar Association, chartered accountants and the Canadian Tax Foundation. If necessary, he stressed, the dual corporation income tax rate should be retained, even if other tax reform measures proceed, until a new incentive plan can be implemented.

Principles of the Ontario small business proposal could also be incorporated into a tax credit plan to encourage capital investment in Canadian-controlled business in areas of special public interest. The incentive could be aimed at Canadian investors in businesses where foreign ownership is restricted to 25 per cent, or any other appropriate qualification.

Comparing this approach to the proposed Canada Development Corporation, the Treasurer said it "would decentralize investment decisions in areas identified for special incentive, as opposed to even more centralization in another government bureaucracy".

The Ontario plan for small business has advantages over both the Commons and Senate committees' proposals, according to the paper. It suggests that the Commons proposal of a disappearing incentive would impose a tax of 66.3 per cent on the first \$70,000 of business income above \$35,000. Similarly, the Senate proposal would entail a tax rate of 100 per cent on the first \$21,150 of business income above \$100,000. It is felt that these high rates would penalize success and encourage tax manipulation to keep income down. Ontario also feels that a size of newness test such as proposed by both the Commons and Senate committees would be

difficult to administer and would penalize growth.

Acknowledging that the federal government is also preparing a small business incentive proposal, Mr. MacNaughton urged that it be referred to the provinces for review and discussion along with the Ontario plan.

#### *Highlights of Proposal*

- A personal income tax credit (reduction) of 50 per cent of increased business investment, to individual owner-operators, would replace the present dual corporation income tax rate over a staging period;
- The tax credit would be restricted to individuals who combine their own capital and efforts to run their own business, alone or with others;
- The tax credit would be available only to Canadian residents — not to non-residents, passive investors or corporations;
- The maximum annual credit would be limited to \$10,000 with a lifetime limit of \$100,000.
- Increased business investment which resulted in a higher tax credit than could be deducted in the year of investment could be carried back one year and forward indefinitely;
- Investment in proprietorship, partnership or incorporated business would qualify;
- Property investments, portfolio securities and mining, gas and oil investments would not qualify;
- Value of the incentive would be recovered fully or partially on death or permanent emigration and on disposition or withdrawal of investment;
- Reasonable rollover provisions would permit reinvestment and avoid lock-in effects;
- The proposed maximum annual tax reduction available to an individual provides approximately the same maximum benefit now available from the lower corporate rate;
- Use of a tax credit approach would give substantially the same proportionate benefit to both low- and high-income earners.

#### **Effects of Ontario's**

##### **Personal Income Tax Proposals**

On November 30, 1970 the Taxation and Fiscal Policy Branch of the Department of Treasury and Economics published a staff paper demonstrating the financial feasibility of Ontario's proposals for personal income tax reform in Canada.

The "Effects of Ontario's Personal Income Tax Proposals" is a detailed analysis of



Ontario's proposals for personal income tax reform presented in Winnipeg during the June meeting of the ministers of finance. The analysis is based on the Ontario General Income Tax Analyser (GITAN) and is on exactly the same basis as the "Analysis of the Federal Tax Reform Proposals, also presented at the Winnipeg conference.

Included in the staff paper for the first time is an income tax rate schedule designed to complement Ontario's other proposals.

The results of the analysis of Ontario's proposals indicate that over the entire tax system the Ontario reforms would produce no over-all revenue changes in the test year 1969. Revenue from the personal income tax would fall by some \$300 million, a loss which would be recovered from changes to the corporation tax and the taxation of capital gains.

Ontario's proposals for personal income tax reform are based on a selective approach to providing tax relief for low income persons, and include a provision designed to integrate sales, property and income taxes for very low-income Canadians. On the basis of 1969, the Ontario personal income tax proposals would provide \$188 million in cash transfers to Canadians not currently earning enough to pay income tax, in order to offset the property and sales tax these persons pay. The proposals would provide

a further \$75 million in added exemptions for single Canadians earning less than \$3,000 and families of four earning less than \$5,100. Other proposals include \$290 million in tax reductions for employment expense allowances and \$50 million in tax credits for child care costs incurred by working mothers and single parents. Approximately \$185 million in revenue increases would arise due to the taxation of a variety of currently untaxed items such as employer medicare contributions and a revised treatment of fringe benefits, among others.

The rate schedule proposed by Ontario contains a variety of interesting new features, the most notable of which is a split rate. The proposed rate schedule contains one set of rates for single individuals and a second preferential set to be applied to couples and families, the two rates merging to form one rate at a taxable income of \$3,000. The effect of the rate differential is to provide a constant \$110 difference in taxes between single persons and families at equal taxable incomes. Other features include low initial rates (12 per cent for families in contrast to a federal white paper rate of 21.76 per cent and a present rate of 14.80 per cent), a modest progression in rates over the middle income range and a top rate of 65 per cent on taxable income over \$100,000. The effects of the

proposed rate schedule, when combined with Ontario's other proposals are to provide tax reductions for single persons earning less than \$5,600, couples earning less than \$9,300 and families of four earning less than \$10,000 per year.

The GITAN analysis of Ontario's proposals clearly shows that they do indeed constitute a viable reform alternative, producing no overall revenue change, while at the same time providing more significant tax reductions for low-income persons than any set of proposals put forth to date. By using a selective approach to tax reduction and tax credits instead of exemptions whenever possible, it would be possible to provide almost \$400 million in low-income tax relief without massive increases in taxes on middle and lower middle income taxpayers.

*Copies of the five publications: Ontario Proposals for Tax Reform in Canada; Tax Reform and Small Business; Analysis of the Federal Tax Reform Proposals; Effects of Ontario's Personal Income Tax Proposals; and Technical Study on Tax Reform and Small Business are available upon request from the Taxation and Fiscal Policy Branch, Policy Planning Division, Department of Treasury and Economics, Frost Building, Queen's Park.*



# The Development of Ontario Economic Accounts

M. V. Chari and R. H. Frank

Department of Treasury and Economics

In 1969 the Economic Analysis Branch of the Department of Treasury and Economics initiated a continuing research program to explore in depth the methodology of regional product estimation and, in particular, to develop national account type data on the provincial and sub-provincial levels. Reflecting the existing data and time limitations, this research was concentrated mainly on those components available at the national level which are susceptible to provincial decomposition. Provincial economic accounts constitute an invaluable tool for quantitative economic analysis and provide the indispensable data base for the development of an econometric model for the province.

During the second half of 1969 a comprehensive set of economic accounts with a conceptual framework similar to the national accounts was designed for the Province of Ontario. Estimates of the various components of the provincial accounts were essentially derived from the published national accounts and related information available from Dominion Bureau of Statistics publications.

Reflecting the availability of new data and significant improvements in the statistical information system, DBS recently completed a comprehensive revision of the Canadian national accounts. However, since these revisions were not available at the time when the Ontario research project was initiated, the provincial income and expenditure components were first estimated on the basis of the available unrevised national accounts data. Nevertheless, this initial effort proved to be extremely useful in developing the basic conceptual framework and methodology required to derive provincial income and expenditure estimates. As the revised national accounts became available<sup>1</sup>, comparable adjustments to the provincial accounts were implemented. In addition, revision of the data provided an opportunity to re-examine the basic concepts and methods used in developing the provincial accounts to ensure their compatibility with the new DBS format.

It should be emphasized that at provincial level there is a choice of two basically different alternatives within the framework of the traditional social accounting system, i.e. the "national" and the "domestic" concept. In general the "national" and the "domestic" concepts essentially distinguish incomes received by residents of the region from outputs produced within that region. However, at the provincial level the basic

conceptual difference between "income" and "output" must be independently recognized. For the purpose of this study, the income rather than the product approach was adopted and the income and expenditure estimates for the province of Ontario shown in the statistical appendix are based on the "national" concept.

However, it is recognized that both the national and domestic concepts have advantages and disadvantages depending on the intended analytical use of the resulting estimates. Generally speaking, the accounts based on the "national" concept provide a deeper insight into the impact and dependence of the Ontario economy on the rest of Canada whereas the purely "domestic" framework measures more effectively economic activity strictly within the geographic confines of the province.

For this reason, the Economic Analysis Branch has initiated, during the second half of 1970, the development of a set of income and expenditure estimates based on the "domestic" concept to facilitate a more comprehensive analysis of the interaction of the Ontario economy with other provinces and the rest of the world. Work on this project is expected to be completed early next year and a detailed description and comparative analysis is scheduled for publication in the *Ontario Economic Review*.

The present study describes in detail the underlying methodology for the development of a comprehensive set of provincial economic accounts on the basis of the "national" concept. The first section outlines the conceptual framework of the Ontario accounts, while the second part of the article provides a concise exposition of the estimation procedures employed. The final section presents a description of the sectoral accounts and their structural interrelationships. Annual estimates of the major components of Ontario Provincial Product for the period 1957-1969 are presented in the Appendix. A complete historical tabulation and analysis of the sector accounts will be published in a special supplement of the *Ontario Economic Review*.

## THE CONCEPTUAL FRAMEWORK

The estimation of provincial product by decomposition of national series rather than by collection of independent provincial data implies that the structure and conceptual framework of the Ontario provincial accounts are determined to a significant degree by the national accounting system. Never-

theless, some modifications, such as the explicit inclusion of interprovincial flows, were necessary in developing regional components which have no direct counterpart in the basic national accounting system.

National accounting essentially provides a systematic description of the operation of the economy by bringing together the various transactions between the different economic units and organizing them into a set of inter-related sector accounts. The sector accounts are typically designed to distinguish between relatively homogeneous classes of transactors and the types of transactions. The exact number of sectors and types of transactions distinguished in a national accounting system obviously depend upon the desired level of detail, the availability of data and ease of statistical estimation, the underlying institutional framework and the extent of their usefulness in economic analysis.

In the Canadian System of National Accounts, four sectors or transactor groups are distinguished: persons, governments, business, and non-residents. Similarly, four types of transactions are identified: (i) transactions in which the services of factors of production are exchanged for money or claims on money; (ii) transactions in which goods and services produced domestically or imported (other than the factors of production) are purchased with money or claims on money; (iii) transactions in which financial claims (and not real product) are exchanged for money or claims on money; (iv) transactions in which goods, services, money, or financial claims are remitted with none of these items being received in exchange and are, therefore, collectively designated as transfer payments.

This broad classification of sectors and transactions is retained in the recent DBS revisions. However, significant changes have been made in the definitions of the sectors, and in the conceptual treatment of certain transactions which entailed a major reclassification of items in the revised format of the sector accounts. For example, public hospitals have been transferred from the personal to the government sector, municipal waterworks from government business enterprises to general government, social insurance contributions are now treated as part of personal income, and withholding taxes are regarded as incomes accrued to non-residents.

Essentially, the transactions for each sector can be organized into four basic accounts:

<sup>1</sup>The summary tables of the revised national accounts have since been released: Dominion Bureau of Statistics, National Income and Expenditure Accounts, 1926-1968, August 1969; a special supplement to the detailed

report National Income and Expenditure Accounts to be published later. The corresponding analysis of the sector accounts was provided through the courtesy of the Dominion Bureau of Statistics.



production, income and expenditure, saving and investment, and financial flows. These four accounts for each of the four sectors can be conveniently regrouped to form a compact set of sector accounts. The Canadian national accounts prior to the recent revision consisted of a set of six sector accounts: an income and expenditure account for persons, governments and non-residents respectively, a production account for the business sector (business operating account), a consolidated investment income appropriation account and a national saving account.

In the revised format income and expenditure accounts are identified for the following sectors: persons, including private non-profit institutions and unincorporated business; government; corporate and government business enterprises; and non-residents. The former business operating account has been expanded into a consolidated production account. The saving and investment account is now shown separately for each of the four sectors instead of a single consolidated statement, thus distinguishing between the current income and expenditure accounts and the capital finance account for each of the four sectors. The previous investment income appropriation account which represented a consolidation of all sectors has been abolished but most appropriations of investment income appear now in the current income and expenditure account for corporate and government business enterprises.

The national accounts constitute the essential data base for the design of provincial accounts. The theoretical basis and the conceptual framework of the national accounts have been taken into account in attempting their regional decomposition. Attention was directed to reconciling the two formats of the sector accounts in order to take maximum advantage of the information available and to arrive at an internally consistent structure for the provincial accounts.

### The Sectors

The sectoral classification of the Ontario provincial accounts was determined on the basis of the structure and availability of the national time series and the intended use of the provincial estimates. Six sectors were incorporated in the provincial accounts: a personal sector; the various levels of government in Ontario; the business sector; the federal government; the rest of Canada; and the rest of the world. An alternative classification comprising only four sectors, as used

in the national accounts, would imply consolidation of the federal government, the rest of Canada, and the rest of the world into a single non-resident sector.

Although these sectors have the common characteristic of being non-resident relative to Ontario, they differ significantly in terms of their relationships with the various Ontario sectors. In view of their policy implications for the Ontario economy it is important to explicitly distinguish federal-provincial transactions. As it is statistically difficult and of less significance from a policy point of view to isolate the various sub-sectors of the rest of Canada sector, they were consolidated into a composite sector. However, attempts have been made, whenever statistically feasible, to tentatively differentiate economic units within the rest of Canada sector.

The definitions of the various sectors conform closely to the corresponding national concepts. Thus, the personal sector is composed of all persons (including private non-profit organizations) resident in the province of Ontario. The residence status, at the operational level, is determined strictly by the classification scheme adopted by DBS for the provincial distribution of personal income. The Ontario government sector comprises all general government departments and agencies at the provincial and local levels. Government business enterprises are treated as part of the Ontario business sector, while public hospitals, starting with 1961, are included in the government sector rather than in the personal sector in accordance with the recent DBS revisions.

Although the national accounts definition of the business sector was accepted in broad terms, some definitional modifications were introduced to facilitate the conceptual and statistical treatment of corporations operating in Ontario as well as in other provinces. The alternatives are to treat such corporations either as single entities ascribing their total income to one particular province or to allocate corporate income to those provinces in which a company operates. Essentially, this implies the derivation of corporate income either on a "national" basis with a subsequent adjustment to a "domestic" concept or defining the corporate sector as inclusive of all operating establishments in a particular province regardless of its legal entity yielding a "domestic" income estimate which could then be adjusted to the "national" concept.

While both approaches have advantages and disadvantages, the former was adopted as a basis for the development of the Ontario provincial accounts since its application preserves the legal entity of corporations and results in a meaningful provincial distribution with respect to intersectoral transactions. Therefore, all corporations filing tax returns with Taxation District Offices located within the province of Ontario in accordance with the information provided by the Department of National Revenue, are considered as belonging to the Ontario corporate sector.

The federal government sector is treated essentially as non-resident in a national accounting sense. Only transactions between the federal government and persons, businesses and governments of Ontario are considered, while all federal operations conducted with those outside the province are ignored. This conceptual treatment emphasizes the "national" rather than the "domestic" basis of income estimation.

The conceptual basis for the estimation of the remaining two non-resident sectors is similar to that of the federal government. The rest of Canada sector is composed of all persons, governments and businesses belonging to, or resident in, any of the provinces of Canada except Ontario, with each economic unit of the rest of Canada being defined similarly to the corresponding sectors of Ontario. The rest of the world sector compares exactly with the non-resident sector of the national accounts and includes all persons who are not normally resident in Canada and all governments and business located outside of the geographical boundaries of Canada.

### The Transactions

As the provincial accounts are basically derived from the decomposition of the aggregate national estimates, the national accounts definitions of the various components of income and expenditure are retained in general at the provincial level. However, certain modifications had to be made in the conceptual treatment of the intersectoral transactions at provincial level.

An important difference between the Ontario and the national accounting systems stems from the conceptual treatment of the various non-resident sectors identified separately for the province. It should be noted that national transaction data have been decomposed to arrive at the corresponding



Ontario components. In general, the criterion used to determine the Ontario share is whether the transacting unit is resident or non-resident independent of the location where the physical output associated with the transaction is produced. In other words, the "national" basis rather than the "domestic" basis is emphasized in the provincial allocation of national totals. However, in the final consolidation, appropriate adjustments are made to convert the "gross product" from a "national" to a "domestic" concept.

The distinction between the "national" and "domestic" concepts of gross product adopted in the provincial accounts is not strictly analogous to the corresponding conceptual treatment accorded at the national level. In the national accounts, adjustments are made only for certain investment incomes — mostly interest and dividends. Other factor incomes such as wages and salaries received from, and paid to, non-residents are ignored on the grounds that they are relatively insignificant for purposes of converting gross product from a "national" to a "domestic" basis and vice versa. Adoption of a similar convention at the provincial level would obviously distort the measure of total product. For example, the federal-provincial or interprovincial wage payments (or receipts), can hardly be regarded as insignificant. Accordingly, exports and imports are redefined to include, in addition to the trade flows of goods and services, the flows of all factors of production as far as they could be identified.

The transactions with all non-resident sectors are uniformly classified into three groups: factor incomes received or paid, receipts or payments for goods and services other than factors of production, and transfer payments. The first group of transactions is applied to adjust gross product from a "national" to a "domestic" basis and vice versa, while the first and second groups together determine the trade balance in the expenditure approach to provincial product estimation. The transfer items are excluded from both the income and expenditure aggregates.

A different conceptual treatment is used for interest on the public debt. Interest on the public debt is generally conceived as a transfer payment since it does not represent payment to factors of production and involves no exchange of goods or services produced within the economy. This approach would be appropriate for a closed economy with no transactions taking place with non-residents.

But, in an open economy, a portion of interest on the public debt is received by non-residents and, to this extent, it does not constitute merely a transfer of money but a potential claim on domestically-produced goods and services. Moreover, from the point of view of the government, borrowing abroad differs significantly from domestic borrowing. On the basis of these considerations, the portion of interest on the public debt paid to non-residents is recorded in the national accounts as part of the earnings of non-residents and is included in imports as a factor payment; it is considered as a charge against domestic product but not as a part of Canada's national income.

A straightforward extension of this approach to the provincial level would be inappropriate for various reasons. At the national level, the choice of treating interest on the public debt paid to non-residents as a transfer payment or as a factor income is not of great importance because of the relatively small magnitudes involved. However, at the provincial level, the corresponding amounts are of much greater significance, especially when the federal government and the rest of Canada are regarded as non-resident.

In the Ontario provincial accounts all payments of interest on the public debt, to both residents and non-residents, are regarded as transfer payments. Interest payments made by the Ontario government to non-residents either abroad or in the rest of Canada can at best be considered as a transfer of money or claims on money. Such payments convey no potential claim on domestically produced output, in the sense that the corresponding receipts need not necessarily be used to purchase goods and services produced only in Ontario. On the same basis, interest on public debt received by Ontario residents from non-residents such as the federal government or rest of Canada governments cannot be conceived as an addition to the provincial product.

Prior to the DBS revisions, interest and dividend payments to non-residents in the national accounts were measured net of withholding taxes, which in turn were treated as part of federal government investment income received directly from the business sector. However, in the revised format, withholding taxes are regarded as part of the income accruing to non-residents. Thus, all incomes paid to non-residents are measured gross of withholding taxes. However, there

is no corresponding entry for the withholding tax component in the federal government account of transactions with Ontario, since it reflects only an intersectoral transfer between the federal government and non-residents abroad.

The treatment of capital formation and physical change in inventories in the provincial product estimation differs significantly from that in the national accounts. In the national accounts, these items are considered on a domestic basis in the sense that the corresponding goods are physically located within the geographical boundaries of Canada (regardless of their ownership status). This implies that any acquisition of capital goods abroad by the business sector would not be regarded as part of domestic capital formation nor as imports unless the goods in question are physically brought into Canada. The corresponding expenditures are regarded as financial flows and hence would be included in the "surplus on current account with non-residents" which is added to domestic capital formation in the consolidation of the saving and investment account. The extension of this approach to the provincial level not only involves statistical problems of measurement but appears to be inappropriate, especially in view of the extent of interprovincial operations of large multi-regional companies.

Thus, in the provincial accounts investment is measured on an ownership basis rather than on the physical location of assets. Business gross investment in fixed assets is defined as including all capital expenditures made in Canada by the business sector of Ontario, regardless of the operational location of the corresponding assets. This investment concept does not correspond to the conventional definition, since it excludes capital expenditures related to the transfer of existing assets as well as acquisitions of capital goods abroad. A similar concept using the ownership criterion is adopted for defining the physical change in inventories.

## ESTIMATION PROCEDURES

At the national level, essentially two broad approaches are used to arrive at the measure of gross product, the "income" approach and the "expenditure" approach. In principle, both approaches can be adopted at the provincial level. The "income" approach involves aggregation of various factor incomes to arrive at net product at factor cost, which adjusted for capital consumption allowances,



indirect taxes and subsidies yields the gross product at market prices. The "expenditure" approach, on the other hand, sums final purchases by all residents to which the total exports less imports and the change in inventories are added to arrive at gross expenditure. Theoretically, these two methods should yield identical measures. However, in practice these aggregates differ, resulting in a statistical discrepancy. The difference is divided into two equal parts and posted as a "residual error" so as to make the measures of both gross product and gross expenditure identical.

Gross Provincial Product for Ontario is arrived at by using both approaches since the estimates are essentially derived from a detailed analysis of sector accounts. The provincial sector accounts are estimated by allocating each transaction presented in the corresponding national sector accounts. All transactions at the national level can be grouped into three categories: transactions between two distinct sectors, transactions between units within a single sector, and accrual items consisting essentially of business investment and capital formation.

A typical intersectoral transaction at the national level can be conceived in two different ways for purposes of provincial allocation. First, from the point of view of the recipient, the total amount involved can be regarded as received by the corresponding Ontario and non-Ontario sectors. Secondly, from the point of view of the disbursing unit, the same amount can be regarded as paid by the corresponding Ontario and non-Ontario sectors. Thus, an intersectoral transaction at the national level, say between sectors X and Y, can be disaggregated into four different components.

Disbursing Unit Y	Receiving Unit X		
	Ontario	Non-Ontario	Total
Ontario			
Non-Ontario			
Total			

This two-way classification was generally adopted for allocating all intersectoral transactions available at the national level to the Province of Ontario. However, exceptions to this general rule were made in specific cases. Marginal allocations both from the recipient's and disbursing unit's point of view for certain components such as personal income and its major parts were available in the

national accounts. Other intersectoral transactions, for which no such provincial breakdown is directly available, were allocated on the basis of supplementary information available from published and unpublished sources. For example, almost every component in the government sector accounts (provincial and municipal governments and hospitals only) was disaggregated into Ontario and rest of Canada shares on the basis of the available information on government finance.

Using the marginal totals of the tables for each intersectoral transaction as necessary constraints and possible guidelines, the respective distributions among the inner cells as per the above lay-out were made. For this purpose, appropriate ratios were derived for each component, either on the basis of auxiliary information or by making specific assumptions. For example, net income received by farm operators or by non-farm unincorporated business in Ontario was assumed to be entirely generated within Ontario and recorded directly as a payment by the Ontario business sector. However, for other components such as wages, salaries, and supplementary labour income, and intersectoral purchases of goods and services, a complete four-way allocation as per the above lay-out was made.

However, this approach is not applicable to transactions within a single national sector. First, almost all intra-sectoral transactions such as intra-business purchases of goods and services or intra-governmental transfers are assumed to cancel out and hence are not shown explicitly in the national accounts. One of the most important exceptions to this general format is direct services of persons which is shown explicitly as an intra-personal transaction in the national accounts since it constitutes a factor income. It was assumed that interprovincial intra-personal wage payments are not significant, at least in the net sense. Accordingly, the value of direct services of persons in Ontario is derived residually from the wages, salaries, and supplementary labour income allocated by province, after deducting the corresponding receipts from other sectors. An alternative estimate was also derived as a component of personal consumption expenditure and compared with the former estimate prior to selecting the most appropriate measure.

All intra-governmental transfer payments made by the Ontario provincial government

conceptually cancel with the corresponding receipts of Ontario municipalities and hospitals and vice versa. However, net transfer receipts from the federal government were explicitly estimated on the basis of the available information on government finance. On the other hand, no adequate estimate of interprovincial intra-business purchases of goods and services could be made due to lack of data in this area. The exclusion of this component from the provincial accounts does not seriously affect the aggregate measure of Gross Provincial Product. Such transactions are likely to take place on balance in a net sense, implying that purchases are of the same magnitude as the corresponding sales. This tends to understate exports and imports, although the error involved is not necessarily of the same order of magnitude, since the corresponding trade in consumption goods and services has already been taken into account in the allocation of the appropriate intersectoral transactions.

An entirely different approach to provincial allocation was adopted for the income and expenditure components which are shown as transactions strictly in the accounting sense and do not represent payments (or receipts) between one sector and another; examples of such items are corporate profits, capital formation, value of physical change in inventories, and capital consumption allowances. A fairly comprehensive analysis of corporate profits and related data such as corporate taxes and dividends was made. It should be recalled that the Ontario corporate sector has been defined on the basis of its legal entity. Thus, an Ontario corporation may operate within the geographical boundaries of Ontario and maintain establishments outside of Ontario. This definition applies also to non-Ontario corporations. Thus, total corporate profits at the national level can be split into a two-way classification.

Profits earned	Profits of Corporations of		
	Rest of Ontario	Canada	Total
In Ontario			
Outside Ontario			
Total			

The Department of National Revenue provides information on the marginal distribution of Canadian corporate profits compatible with this classification. This provincial



breakdown together with supplementary information on the provincial assessment of corporate taxes yields the allocation for the inner cells. Corporate taxes have been estimated as payments to the federal government and to the Ontario and rest of Canada provincial governments respectively. Under the existing legislation, a corporation pays provincial taxes only on that portion of profits which is earned in a particular province. Differential provincial tax rates have been taken into account in the estimation procedures. Dividends paid by Ontario and rest of Canada corporations are distributed among recipients in Ontario, the rest of Canada, and the rest of the world.

In order to allocate capital formation and changes in inventories, a distinction was made between the ownership of assets and the physical location of assets. Thus, total business capital formation at the national level can be decomposed into four parts:

Capital Formation located	Capital Formation by		
	Ontario business	R.O.C. business	Total
In Ontario			
Outside Ontario			
Total			

The corporate profit analysis with appropriate adjustments made to account for the unincorporated business sector provided the necessary basis for the allocation of investment by ownership status, while the distribution by location is obtained on the basis of published information on public and private investment in Canada. This information was then used to allocate provincially capital consumption allowances and other related data. A similar procedure was adopted for value of physical change in inventories as well as for inventory valuation adjustments attributable to the Province of Ontario.

## THE SECTOR ACCOUNTS

The various income and expenditure components and the intersectoral transactions are arranged in the form of eight basic accounts for the Province of Ontario. A double-entry bookkeeping system is maintained throughout, thus balancing total revenue (or receipts) with total expenditure (or payments) for each account.

The structure of the Ontario sector accounts resembles more closely the original

rather than the revised format of the national accounts. The unrevised format was adopted because of the conceptual and statistical limitations associated with the revised format at the provincial level, particularly the detailed estimation of the financial flows, and the conceptual separation of the current account from the capital finance account.

### Current Account: Personal Sector

All incomes received by and accrued to all residents of Ontario classified to the personal sector as defined earlier are collected in this account. The main components of personal income are defined identically with those in the national accounts.

Wages, salaries and supplementary labour income and transfer payments are allocated to domestic and non-domestic sources, with the particular economic units specified within the rest of Canada sector. Intra-personal wage payments taking place between Ontario and other provinces are not likely to be of significant order. Similarly, the rest of Canada governments are assumed to conduct their operations within the geographical boundaries of their respective provinces and to employ no residents of Ontario and vice versa.

No further sectoral breakdown of net income of non-farm unincorporated business including rent and net income of farm operators from farm production was attempted since they are assumed to be generated within the Ontario business sector. Interest, dividends and miscellaneous investment income of persons was analyzed by sector as part of the Investment Income Appropriation Account.

On the debit side of this account, all expenditure items of the personal sector are balanced against total personal income to derive personal net saving. The component definitions are again comparable to those used in the national accounts. All items are broken down into payments to domestic sectors and to non-residents. Employer and employee contributions to social insurance are treated in accordance with the DBS revisions as part of personal income and deducted as transfers on the expenditure side.

### Current Account: Government Sector

This account shows the combined current revenue and expenditure of the provincial and all local governments and includes public hospitals starting with 1961. It consoli-

dates estimates for each level of government by grouping together certain basic transactions and indicates the intersectoral flows of transactions.

Taxes and other transfers paid by persons originate by definition from Ontario residents only, whereas direct and indirect business taxes are allocated between Ontario and rest of Canada sources. Direct corporate taxes are calculated on a "liability" rather than on a "collections" basis and therefore include the excess of tax liabilities over collections which are not distinguished separately in the provincial accounts.

No sectoral breakdown of government investment income has been attempted. Although it can be assumed that the remitted profits of government business enterprises are generated entirely within the Ontario business sector, interest and miscellaneous investment income can conceivably be received from other sectors as well. Because of the statistical problems involved, both these receipts are merged together with all other provincial investment income components and analyzed collectively for sectoral origin in the Investment Income Appropriation Account.

Included in current revenue are transfers received by all levels of Ontario government from the federal government. In the national accounts, all intergovernmental transfer receipts cancel with the corresponding payments in their consolidation. However, aggregation at the provincial level cancels only those transfers among the Ontario provincial and local governments and Ontario public hospitals.

The intersectoral division of current purchases of goods and services from persons and business is shown and they are taken as net of government sales to the corresponding sectors. As in the revised national accounts, capital consumption allowances are conceived of as current purchases by government from itself for use of own capital. The remaining items are transfers of interest on the public debt, subsidies, capital assistance and various other payments to persons. These are divided between resident and non-resident recipients except for the last item, other transfers to persons, which is assumed to be made to Ontario persons only.

The saving item represents the surplus (+) or deficit (—) on current account and is essentially defined as a balancing item. Saving as shown here differs from the overall



government surplus or deficit by the amount of government capital expenditures.

### **Operating Account: Business Sector**

This account summarizes the transactions of the Ontario business sector as they relate to the employment of the factors of production. The output of this sector combined with direct imports of goods and services constitutes the total value of sales by the business sector. After allowing for sales to the personal, government and non-resident sectors, the residual is treated as retained within the business sector in the form of accumulated inventories or investment in fixed assets.

Although the conceptual treatment of this account is analogous to that in the national accounts, certain major modifications were made to accommodate the specific definitions adopted for the Ontario business sector and to recognize the extent of interprovincial transactions. At the national level, all intra-business purchases and sales of goods and services cancel in the aggregation process. While intra-business purchases and sales of goods and services within Ontario could be ignored in developing the provincial accounts, the same is not true of sales and purchases between Ontario and the rest of Canada business sectors. Another distinguishing feature of this account is the different conceptual treatment of investment in fixed assets and inventories, as outlined earlier, with ownership rather than location adopted as criterion.

On the revenue side, sales of capital goods are the only interprovincial transactions between businesses which are shown separately. Interprovincial trade among businesses in consumption and intermediate goods could not be taken explicitly into account because of data limitations and statistical problems of measurement. However, the error implied by this exclusion is not expected to be very significant at the aggregate level.

Ontario business sales of consumption and intermediate goods and services to rest of Canada business is offset at least to some degree by a similar flow of goods and services into Ontario, while estimation of consumption expenditures from the buyer's side is assumed to cover purchases from all businesses in Canada. Thus, exclusion of intra-business interprovincial trade in consumption goods is expected to distort only slightly the intersectoral allocation of certain operating account components but not to affect the total magnitudes of these components. The over-

all implication of these exclusions is that the provincial export and import series may be understated, although the error on net balance is likely to be insignificant.

The expenditure side of this account lists those cost items which determine the value of goods and services produced. Included here are both factor costs and other indirect costs which represent a part of the market prices of goods and services. The net difference between total revenue and expenditure is divided into two equal parts and recorded as "residual error" to balance the two sides of the account.

### **Investment Income Appropriation Account**

The Investment Income Appropriation Account collects all elements of investment income and traces their disposition to the various sectors. On the source side, investment income is classified according to the resident status of the disbursing units, with the sectoral identification of the corresponding income recipient indicated wherever statistically feasible. One major investment income component received from the rest of Canada requires some discussion. Ontario corporate retained profits accrued in the rest of Canada represent that portion of total retained profits arising from operations in other provinces. Thus, this item must be deducted from total investment income to arrive at the domestic component. Correspondingly, that portion of the retained profits of rest of Canada corporations accrued in Ontario must be considered as part of Ontario's investment income and recorded as a factor payment to the rest of Canada business sector.

The disposition of total investment income, whether originating in Ontario or elsewhere, is shown in a comprehensive form. Individual components are essentially identified from the recipient's point of view. Although at the national level all intercorporate payments and receipts of dividends cancel out, they must be shown explicitly when dealing with a province. The net balance of receipts over payments forms a part of investment income received by Ontario business.

Interest on the public debt paid to Ontario residents by all governments and interest on the consumer debt received by Ontario business must be deducted since they do not constitute part of the production of goods and services and are excluded from total investment income.

### **Provincial Saving and Investment Account**

In this account, the savings attributable to the various sectors of the Ontario economy are brought together to yield total provincial saving. This total is distributed between investment expenditures of Ontario residents (for fixed assets and inventory accumulation) and the surpluses (or deficits) on account with non-residents which represent net foreign investment (or disinvestment) by Ontario residents.

### **Non-resident Sector Accounts**

These accounts are prepared separately for the federal government, the rest of Canada, and the rest of the world and can easily be generated from the other five accounts within the framework of the double-entry book-keeping system. The balancing item on each non-resident account is posted on the credit side and represents the excess of total payments made by Ontario over the corresponding total receipts.

### **CONCLUSION**

The estimation of reliable time series on provincial income and expenditure and the development of a comprehensive set of economic accounts revealing the intersectoral and interregional flows of product is of major significance for economic analysis. While national income and related aggregates are estimated with a fairly high degree of accuracy and in considerable detail, such estimates at the provincial and sub-provincial levels are virtually non-existent.

Although the Dominion Bureau of Statistics publishes total personal income and its major components by province, the majority of economic account components are available only at national level.

It is in this context that the Economic Analysis Branch of the Economic and Statistical Services Division has initiated the design and estimation of a set of economic accounts for Ontario. This attempt should be interpreted as exploratory in nature, recognizing that the estimates are subject to revision. A significant improvement in the estimation of provincial economic accounts could be accomplished if DBS were to enlarge its scope of operations by providing more detailed data at provincial level in addition to existing provincial personal income. This would facilitate the adoption of a uniform and consistent conceptual framework of income and product estimates by all provinces.



## Provincial Income and Gross Provincial Product, 1957-1969

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Wages, salaries and supplementary labour income	7,027	7,260	7,747	8,126	8,437	9,057	9,716	10,616	11,875	13,428	14,755	16,193	18,216
2. Military pay and allowances	165	172	170	172	189	201	206	208	205	229	250	256	291
3. Corporate profits before taxes	1,674	1,679	1,979	1,851	1,923	2,146	2,473	2,842	3,089	3,250	3,185	3,497	3,693
4. Intercompany dividends received from R.O.C.	172	168	160	247	275	271	276	337	294	357	386	420	460
5. <i>Deduct:</i> Dividends paid to non-residents	-518	-503	-523	-588	-662	-680	-741	-862	-880	-983	-1,031	-1,074	-1,084
6. Interest and miscellaneous investment income	355	375	354	400	434	528	574	584	657	777	863	990	1,151
7. Accrued net income of farm operators from farm production	272	330	257	268	285	310	284	270	308	407	336	367	450
8. Net income of non-farm unincorporated business including rents	1,049	1,102	1,133	1,094	1,116	1,098	1,227	1,267	1,359	1,446	1,566	1,683	1,751
9. Inventory valuation adjustment	-27	-17	-51	-6	-19	-50	-101	-54	-141	-145	-143	-141	-243
10. <i>Net Provincial Income at Factor Cost</i>	10,169	10,566	11,226	11,564	11,978	12,881	13,914	15,208	16,766	18,766	20,167	22,191	24,685
11. Indirect taxes less subsidies	1,696	1,711	1,885	1,926	2,045	2,306	2,483	2,735	3,157	3,457	3,768	4,140	4,559
12. Capital consumption allowances and miscellaneous valuation adjustments	1,628	1,620	1,759	1,827	1,833	1,985	2,122	2,299	2,496	2,709	2,947	3,104	3,343
13. Residual error of estimate	+291	+163	-41	-17	+154	-156	+180	+61	+58	+410	+221	+131	-94
14. <i>Gross Provincial Product at Market Prices</i>	13,784	14,060	14,829	15,300	16,010	17,016	18,699	20,303	22,477	25,342	27,103	29,566	32,493



**Gross Provincial Expenditure, 1957-1969**

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Personal expenditure on consumer goods and services	8,154	8,732	9,147	9,478	9,655	10,320	11,062	11,758	12,898	14,216	15,447	16,633	18,111
2. Government expenditure on goods and services													
3. Current expenditure	772	871	956	1,057	1,453	1,575	1,779	1,883	2,002	2,449	2,734	3,136	3,557
4. Capital expenditure	463	480	500	486	483	616	687	640	802	934	897	903	912
5. Business gross investment in fixed assets													
6. New residential and non-residential construction	1,941	1,978	1,787	1,664	1,634	1,610	1,759	2,068	2,306	2,699	2,795	3,051	3,360
7. New machinery and equipment	1,165	939	992	1,031	974	1,064	1,181	1,468	1,803	2,169	2,202	2,066	2,373
8. Value of physical change in inventories													
9. Non-farm business inventories	121	-132	221	13	259	111	313	174	531	453	154	215	232
10. Farm inventories and grain in commercial channels	335	-34	-144	67	148	-294	-35	71	-52	87	62	-41	351
11. Exports of goods and services	7,081	7,053	7,575	7,833	8,332	8,878	9,598	11,192	12,295	14,094	15,263	16,878	18,455
12. <i>Deduct:</i> Imports of goods and services	-5,957	-5,665	-6,247	-6,346	-6,775	-7,020	-7,465	-8,890	-10,051	-11,349	-12,230	-13,144	-14,953
13. Residual error of estimate	-291	-162	+42	+17	-153	+156	-180	-61	-57	-410	-221	-131	+95
14. <i>Gross Provincial expenditure at market prices</i>	13,784	14,060	14,829	15,300	16,010	17,016	18,699	20,303	22,477	25,342	27,103	29,566	32,493



**Relation between Net Provincial Income at Factor Cost, Personal Income, Personal Disposable Income, and Personal Saving**

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Net Provincial Income at Factor Cost	10,169	10,566	11,226	11,564	11,978	12,881	13,914	15,208	16,766	18,766	20,167	22,191	24,685
2. <i>Add:</i> Transfer payments (excluding interest on the public debt and transfers from Ontario corporations)	664	821	956	1,055	877	926	990	1,057	1,146	1,275	1,631	1,911	2,192
3. <i>Add:</i> Interest on the public debt	280	303	384	405	436	473	501	553	598	653	695	754	843
4. <i>Add:</i> Interest on the consumer debt	55	60	73	83	87	93	99	106	122	138	148	164	188
5. <i>Deduct:</i> Earnings not paid out to persons	-1,258	-1,281	-1,526	-1,472	-1,482	-1,628	-1,825	-2,188	-2,279	-2,399	-2,326	-2,650	-2,804
6. <i>Equals:</i> Personal Income	9,910	10,469	11,113	11,635	11,896	12,745	13,679	14,736	16,353	18,433	20,315	22,370	25,104
7. <i>Deduct:</i> Personal direct taxes	-1,110	-1,020	-1,110	-1,266	-1,329	-1,418	-1,502	-1,736	-2,011	-2,579	-3,067	-3,668	-4,530
8. <i>Deduct:</i> Other current transfers to government	-35	-37	-128	-128	-136	-140	-147	-182	-223	-230	-221	-321	-430
9. <i>Equals:</i> Personal Disposable Income	8,765	9,412	9,875	10,241	10,431	11,187	12,030	12,818	14,119	15,624	17,027	18,381	20,144
10. <i>Deduct:</i> Personal expenditure on consumer goods and services	-8,154	-8,732	-9,147	-9,478	-9,655	-10,320	-11,062	-11,758	-12,898	-14,216	-15,447	-16,633	-18,111
11. <i>Deduct:</i> Transfers to corporations (Interest on consumer debt)	-47	-52	-63	-73	-74	-79	-82	-88	-103	-117	-126	-139	-161
12. <i>Deduct:</i> Transfers to rest of the world	-36	-37	-40	-40	-36	-37	-42	-42	-44	-45	-55	-44	-49
13. <i>Equals:</i> Saving of persons and unincorporated business	528	591	625	650	666	751	844	930	1,074	1,246	1,399	1,565	1,823



**Matrix of Sectoral Transaction Flows**

## Sector Accounts

Type of Transaction	Personal Sector		Government Sector	
	S <sup>3</sup>	D <sup>4</sup>	S	D
<b>FACTOR INCOMES</b>				
1. Wages, salaries and supplementary labour income of Ontario persons	X	X		X
2. Wages, salaries and supplementary labour income of rest of Canada residents				
3. Net income of non-farm unincorporated business including rent	X			
4. Net income of farm operators from farm production	X			
5. Interest, dividends and miscellaneous investment income of Ontario persons <sup>1</sup>	X			
6. Ontario government investment income			X	
7. Domestic investment income				
8. Federal government investment income <sup>1</sup>				X
9. Intercompany dividends				
10. Ontario corporate retained profits accrued in rest of Canada				
11. Rest of Canada corporate retained profits accrued in Ontario				
12. Corporate dividends to persons from rest of Canada				
13. Corporate dividends to rest of Canada from Ontario				
<b>PURCHASES OF GOODS AND SERVICES</b>				
14. Personal expenditure on consumer goods and services	X	X		
15. Government expenditure on goods and services	X			X
16. Exports of goods and services				
17. Imports of goods and services				
<b>FINANCIAL FLOWS</b>				
18. Personal net saving		X		
19. Government net saving				X
20. Business net saving				
21. Business investment in fixed assets <sup>2</sup>				
22. Value of physical change in inventories <sup>2</sup>				
23. Inventory valuation adjustment				
24. Capital consumption allowances				X
25. Surplus (+) or deficit (—) on federal government account				
26. Surplus (+) or deficit (—) on rest of Canada account				
27. Surplus (+) or deficit (—) on rest of the world account				
<b>TRANSFER PAYMENTS</b>				
28. Transfers to personal sector	X			X
29. Transfers to government sector		X	X	
30. Transfers to business sector		X		X
31. Transfers to federal government		X		
32. Transfers to rest of Canada		X		X
33. Transfers to rest of the world		X		
34. Interest on the public debt paid by Ontario government				X
35. Interest on the public debt paid by federal government				
36. Interest on the public debt paid by rest of Canada governments				

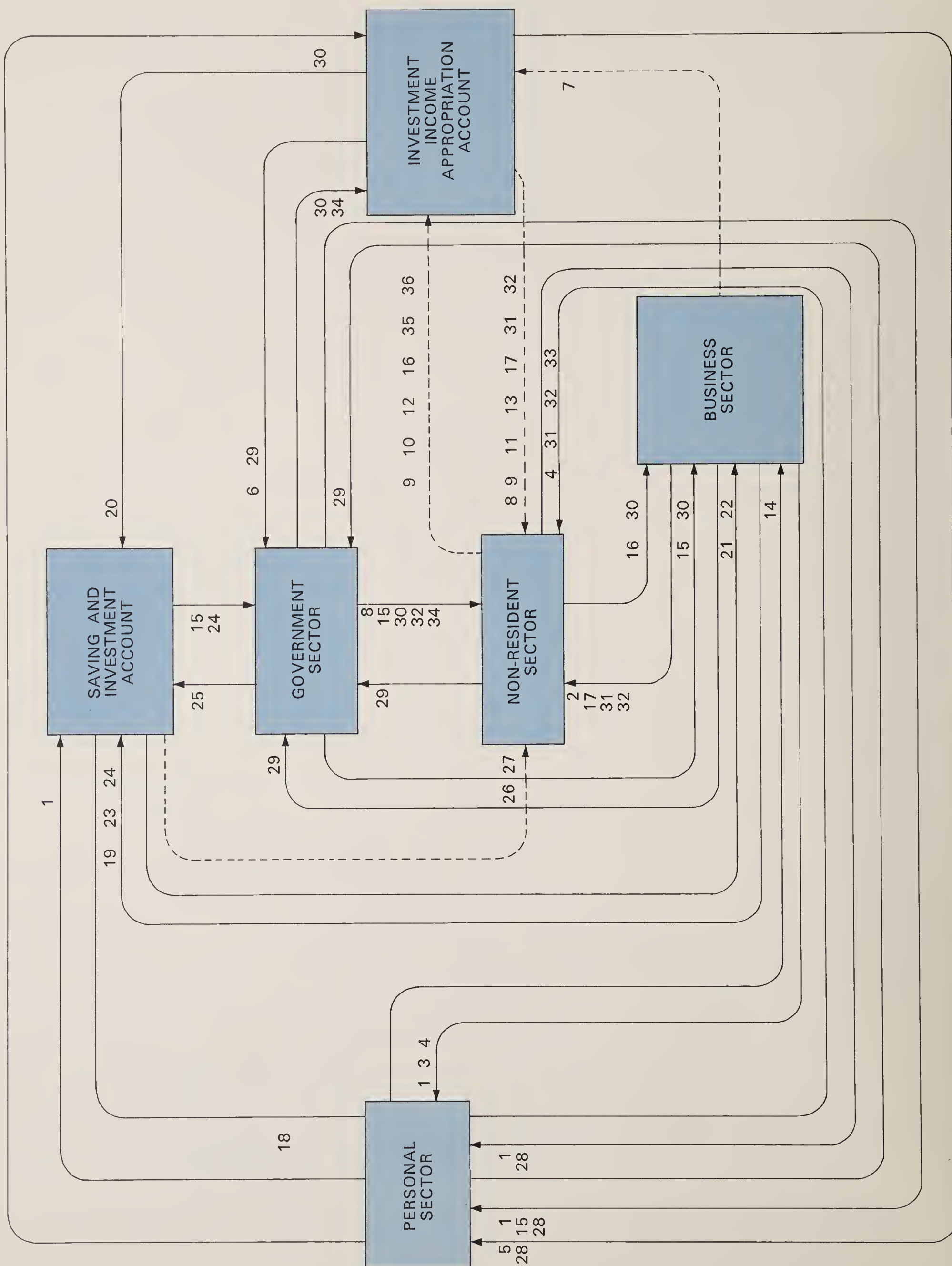
<sup>1</sup>These items include transfers of interest on the public debt which are also covered in Group IV.<sup>2</sup>These investment items can also be conceived of as purchases of goods and services.<sup>3</sup>Source<sup>4</sup>Disposition



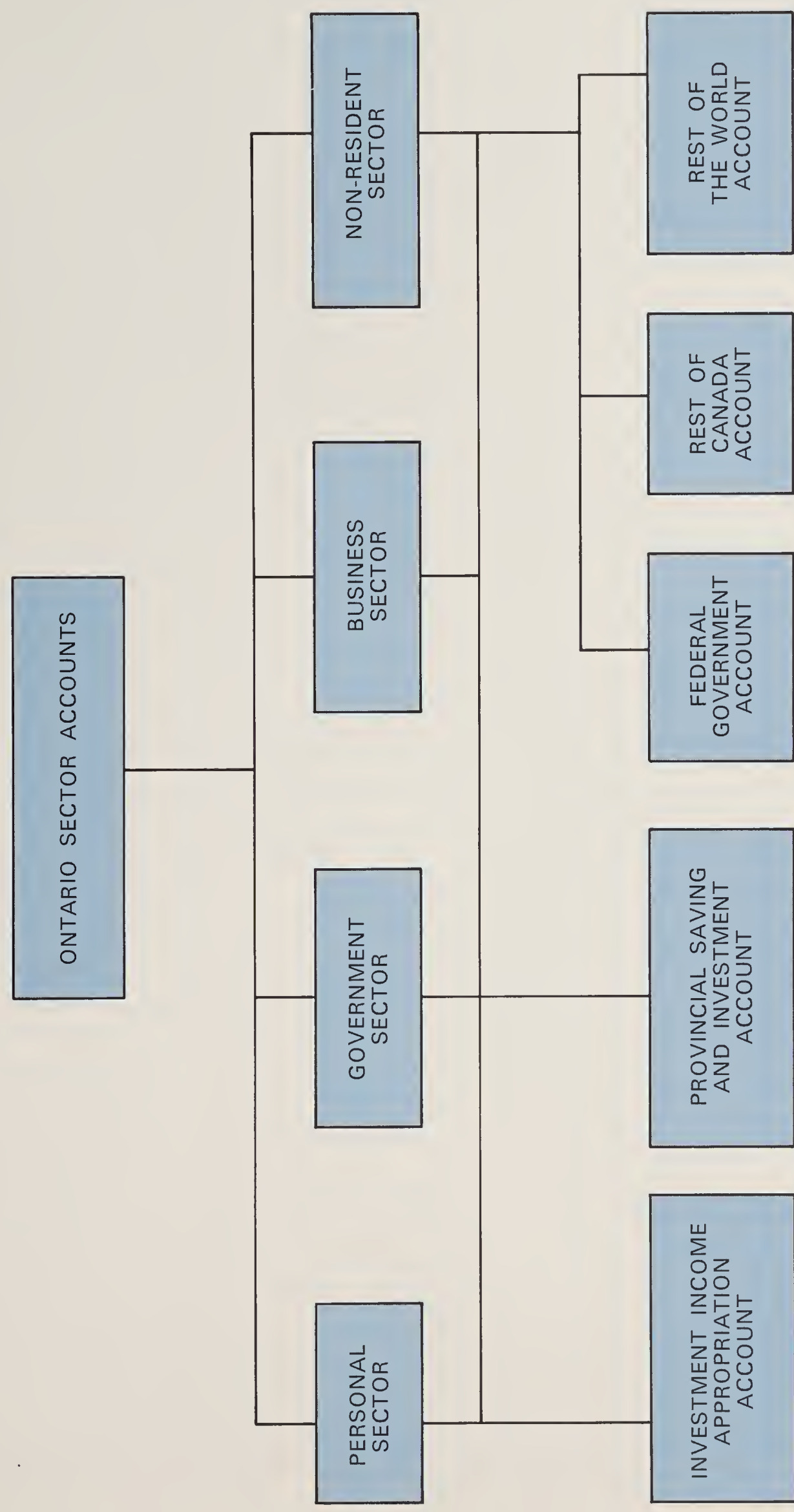




Note: Numbers to left or above arrows refer to the row identification in the matrix of sectoral transaction flows.

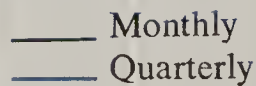
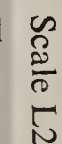
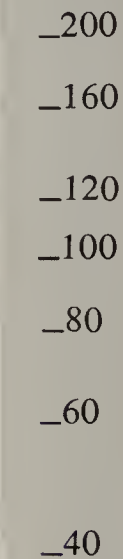
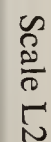
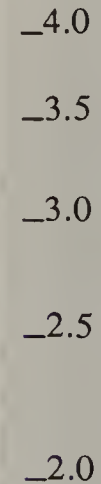
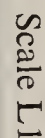
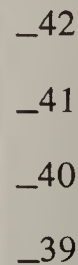
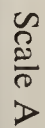




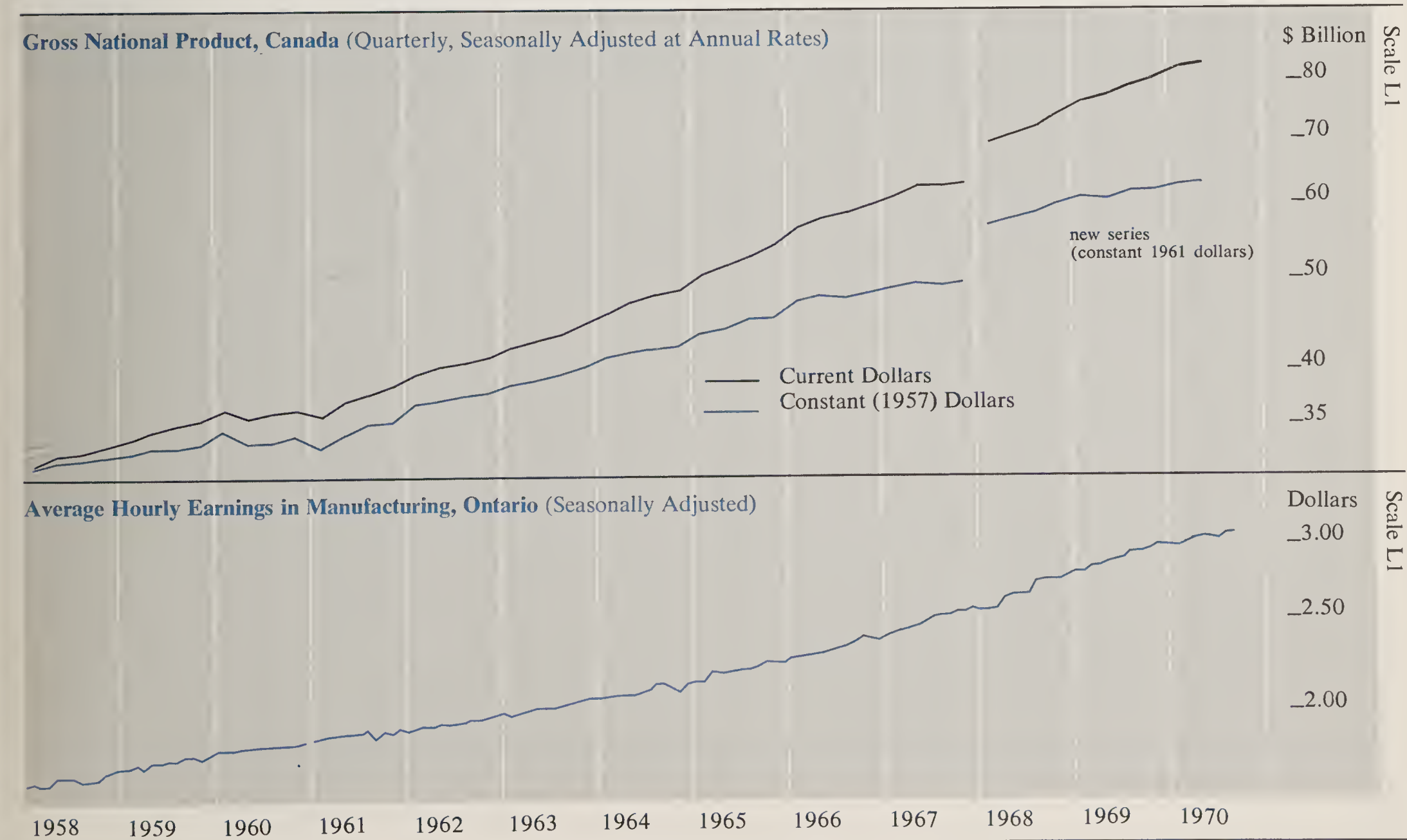




## Leading Indicators

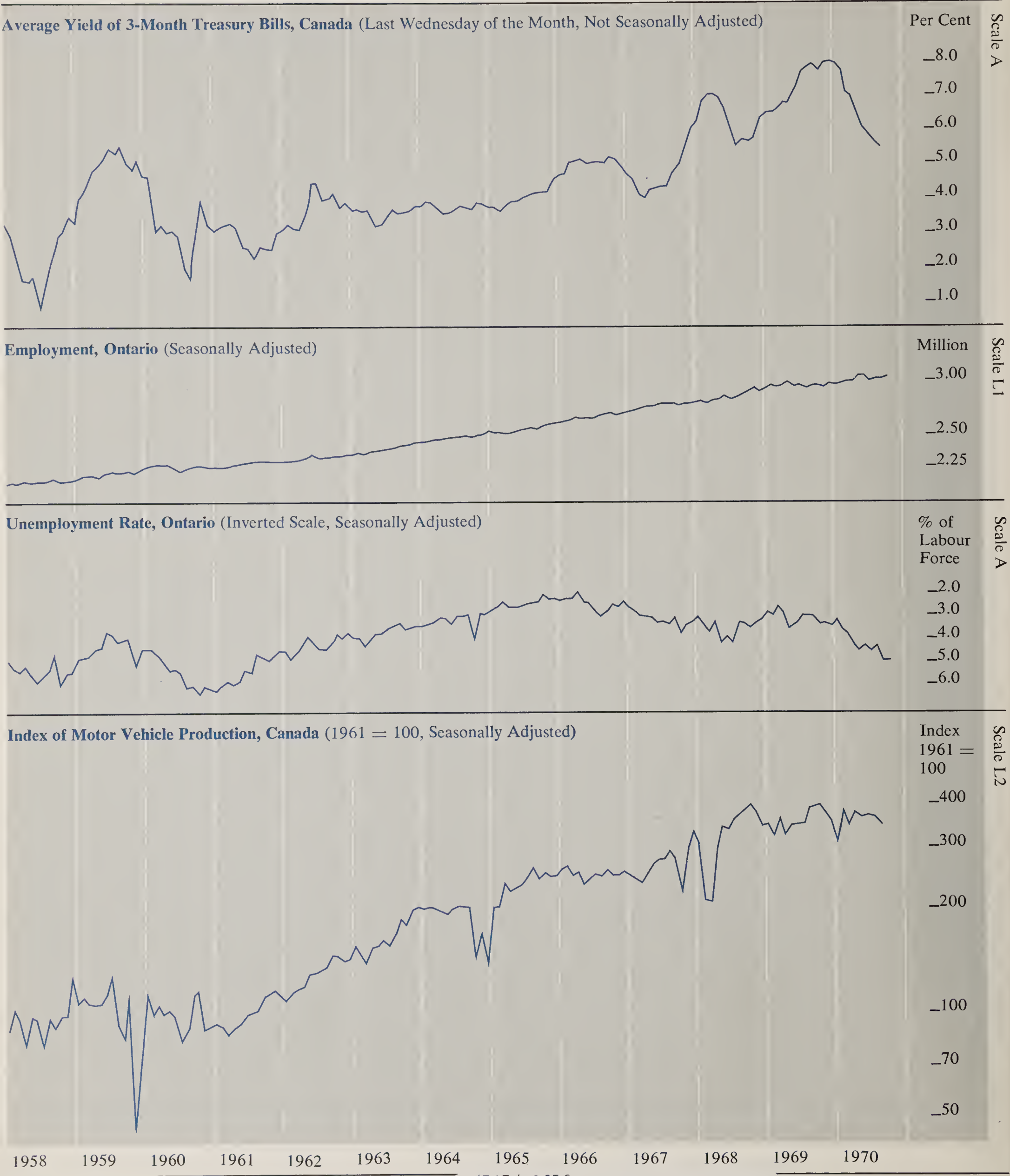


1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
------	------	------	------	------	------	------	------	------	------	------	------	------





# Coincidental and Lagging Indicators



HA/747/.0656  
Ontario. Dept. of Economics and  
Ontario economic review

# Economic Indicators

Seasonally Adjusted

		1970														
		1969	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.
<b>Leading Indicators</b>																
Average Weekly Hours Worked in Manufacturing	Number	40.3	39.9	39.9	39.4	39.6	39.7	39.5	40.0	40.3	40.4	39.3	40.1	40.8		
New Orders in Manufacturing Industries <sup>c</sup>	\$ Million	3,770	3,634	3,754	3,728	3,662	3,696	3,604	3,650	3,774	3,851	3,804	3,883	3,727		
Commercial/Institutional and Industrial Construction Contracts	\$ Million	123.2	86.6	137.3	140.0	72.1	78.4	87.2	142.2	97.4	130.4	159.4	120.2	118.3		
Urban Housing Starts (Annual Rate)	Number	67,300	78,300	59,100	64,700	34,800	33,600	55,700	53,900	37,200	45,200	67,500	77,500	69,200	106,500	
Money Supply <sup>c</sup>	\$ Million	28,403	28,472	28,580	28,917	28,955	28,947	28,817	28,966	29,223	29,668	29,769	29,996	30,125		
T.S.E. Industrial Index <sup>u</sup>	1956 = 100	178.15	182.11	187.65	186.37	177.89	183.92	185.17	171.08	154.21	151.53	157.36	160.28	165.8	162.1	
Business Failures <sup>u</sup>	Number	52	64	54	53	56	71	82	54	65	77	73	48	55		
Business Failures — Liabilities <sup>u</sup>	\$ Million	4.8	3.4	4.6	2.2	9.9	18.7	4.0	2.2	3.4	8.1	3.1	2.8	5.3		
<b>Coincidental and Lagging Indicators</b>																
Gross National Product <sup>c</sup> (Annual Rate)	\$ Million	79,292			80,888			82,660			83,192			84,120		
<b>Leading Indicators</b>																
Average Hourly Earnings in Manufacturing	Dollars	2.97	2.99	3.02	3.06	3.06	3.05	3.11	3.17	3.19	3.19	3.16	3.21	3.23		
3-Month Treasury Bill Rate <sup>c,u</sup>	Per Cent	7.77	7.60	7.76	7.81	7.78	7.60	7.00	6.78	6.34	5.94	5.70	5.51	5.39	5.39	
Cheques Cashed in Clearing Centres <sup>1</sup>	\$ Million	6,570	6,526	6,521	6,240	6,078	6,099	6,661	6,487	6,313	6,386	6,358	6,774			
Retail Trade	\$ Million	901	892	895	909	891	869	884	906	904	887	918	902	930		
Labour Force	000's	3,027	3,035	3,030	3,064	3,044	3,066	3,098	3,111	3,183	3,173	3,122	3,130	3,158	3,179	
Employed	000's	2,932	2,930	2,927	2,957	2,948	2,957	2,981	2,977	3,037	3,038	2,976	2,992	2,998	3,033	
Unemployed	000's	95	105	103	107	96	109	117	134	146	135	146	138	160	146	
Unemployed as % of Labour Force	Per Cent	3.1	3.4	3.4	3.5	3.2	3.6	3.8	4.3	4.6	4.3	4.7	4.4	5.1	5.0	
Wages and Salaries	\$ Million	1,457	1,460	1,487	1,503	1,529	1,549	1,550	1,547	1,571	1,586	1,583	1,599			
Index of Industrial Employment	1961 = 100	129.6	130.7	132.7	132.8	132.1	133.0	132.7	132.1	131.7	131.4	131.1	131.7	129.5		
<b>Leading Indicators</b>																
Index of Industrial Production <sup>c</sup>	1961 = 100	165.9	165.6	169.3	172.0	171.1	174.4	171.5	172.4	170.5	170.2	170.0	170.9	169.4		
Total Manufacturing <sup>c</sup>		166.8	166.7	169.5	170.7	167.8	171.0	168.1	170.0	167.5	167.4	165.4	166.3	163.5		
Non-Durables <sup>c</sup>		153.0	152.4	153.4	154.3	152.3	154.3	152.8	154.8	155.0	152.4	152.8	151.7	151.9		
Durables <sup>c</sup>		183.8	184.1	189.2	190.7	186.8	191.4	186.7	188.6	182.8	185.8	181.7	184.1	177.7		
Mining <sup>c</sup>		141.8	140.3	151.8	163.4	170.2	175.7	170.6	164.2	166.6	170.8	173.4	174.6	177.4		
Electric Power and Gas Utilities <sup>c</sup>		194.6	195.5	194.6	197.0	201.0	203.0	203.0	206.4	203.7	205.1	206.1	205.9	208.4		
Primary Energy Demand (Annual Rate)	BKWH	58.39	59.09	59.56	63.13	64.53	63.91	62.94	63.39	61.60	63.35	65.03	65.68	66.80		
Exports (including re-exports) <sup>c</sup>	\$ Million	1,293.4	1,283.0	1,285.0	1,328.9	1,447.0	1,402.1	1,410.1	1,439.0	1,434.1	1,392.2	1,422.7	1,321.1	1,391.3	1,418.0	
Imports <sup>c</sup>	\$ Million	1,220.1	1,206.7	1,223.2	1,215.0	1,116.8	1,230.6	1,242.6	1,191.6	1,207.1	1,182.5	1,187.5	1,162.3	1,184.5	1,066.0	
<b>Unclassified Indicators</b>																
Foreign Exchange Reserves <sup>c,u</sup>	U.S. \$ Million	2,539	2,629	2,613	2,616	2,698	2,777	2,936	3,179	3,406	3,650	3,689	3,848	3,785		
Industrial Materials Price Index <sup>c,u</sup>	1935-39 = 100	270.4	266.8	267.8	271.5	272.3	272.3	275.7	274.4	273.7	271.5	272.3				
Consumer Price Index <sup>c,u</sup>	1961 = 100	126.6	126.8	127.4	127.9	128.2	128.7	128.9	129.7	129.6	129.9	130.5	130.5	130.2	130.2	130.3

<sup>c</sup>Statistics for Canada.

<sup>u</sup>Not seasonally adjusted.

<sup>1</sup>Ontario less Toronto.



